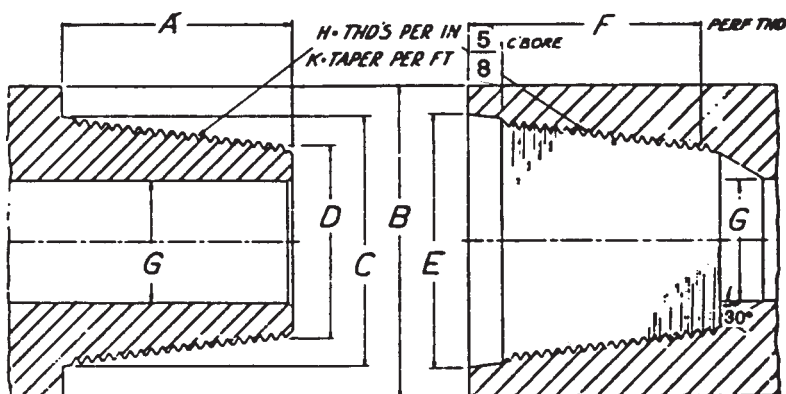




## A.P.I. REGULAR (REG) DIMENSIONAL DATA



### A.P.I REGULAR

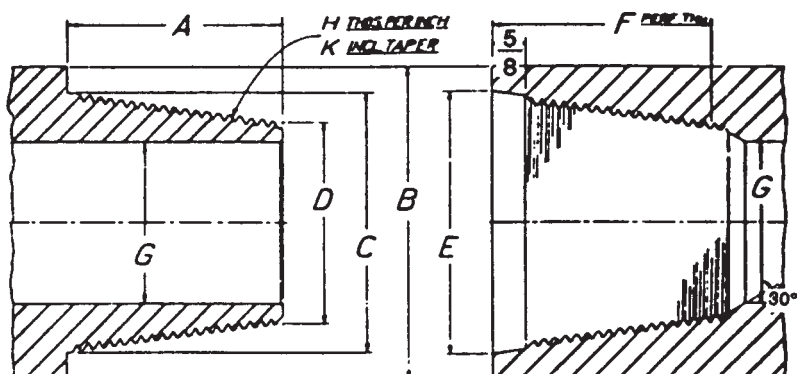
| Size  | A              | B                | C                | D                | E                | F              | G              | H   | K         |
|-------|----------------|------------------|------------------|------------------|------------------|----------------|----------------|-----|-----------|
|       | in<br>mm       | in<br>mm         | in<br>mm         | in<br>mm         | in<br>mm         | in<br>mm       | in<br>mm       | TPI | TPF       |
| 1 1/4 | 2 5/8<br>66.7  | 2 3/16<br>55.6   | 1 23/32<br>43.7  | 1 5/16<br>33.3   | 1 3/4<br>44.5    | 3<br>76.2      | 5/8<br>15.9    | 7   | 2<br>50.8 |
| 2 3/8 | 3<br>76.2      | 3 1/8<br>79.4    | 2 5/8<br>66.7    | 1 7/8<br>47.6    | 2 11/16<br>68.3  | 3 3/8<br>85.7  | 1<br>25.4      | 5   | 3<br>76.2 |
| 2 7/8 | 3 1/2<br>88.9  | 3 3/4<br>95.3    | 3<br>76.2        | 2 1/8<br>54.0    | 3 1/16<br>77.8   | 3 7/8<br>98.4  | 1 1/4<br>31.8  | 5   | 3<br>76.2 |
| 3 1/2 | 3 3/4<br>95.3  | 4 1/4<br>108.0   | 3 1/2<br>88.9    | 2 9/16<br>65.1   | 3 9/16<br>90.5   | 4 1/8<br>104.8 | 1 1/2<br>38.1  | 5   | 3<br>76.2 |
| 4 1/2 | 4 1/4<br>108.0 | 5 1/2 *<br>139.7 | 4 5/8<br>117.5   | 3 9/16<br>90.5   | 4 11/16<br>119.1 | 4 5/8<br>117.5 | 2 1/4<br>57.2  | 5   | 3<br>76.2 |
| 5 1/2 | 4 3/4<br>120.7 | 6 3/4<br>171.5   | 5 33/64<br>140.1 | 4 11/32<br>110.3 | 5 37/64<br>141.7 | 5 1/8<br>130.2 | 2 3/4<br>69.9  | 4   | 3<br>76.2 |
| 6 5/8 | 5<br>127.0     | 7 3/4<br>196.9   | 6<br>152.4       | 5 5/32<br>131.0  | 6 1/16<br>154.0  | 5 3/8<br>136.5 | 3 1/2<br>88.9  | 4   | 2<br>50.8 |
| 7 5/8 | 5 1/4<br>133.4 | 8 7/8<br>225.4   | 7<br>177.8       | 5 11/16<br>144.5 | 7 3/32<br>180.2  | 5 5/8<br>142.9 | 4<br>101.6     | 4   | 3<br>76.2 |
| 8 5/8 | 5 3/8<br>136.5 | 10<br>254.0      | 7 61/64<br>202.0 | 6 39/64<br>167.9 | 8 3/64<br>204.4  | 5 3/4<br>146.1 | 4 3/4<br>120.7 | 4   | 3<br>76.2 |

\* 5 3/4" O.D. is optional.

\* 146.1 mm O.D. is optional.



## A.P.I. FULL HOLE (FH) DIMENSIONAL DATA

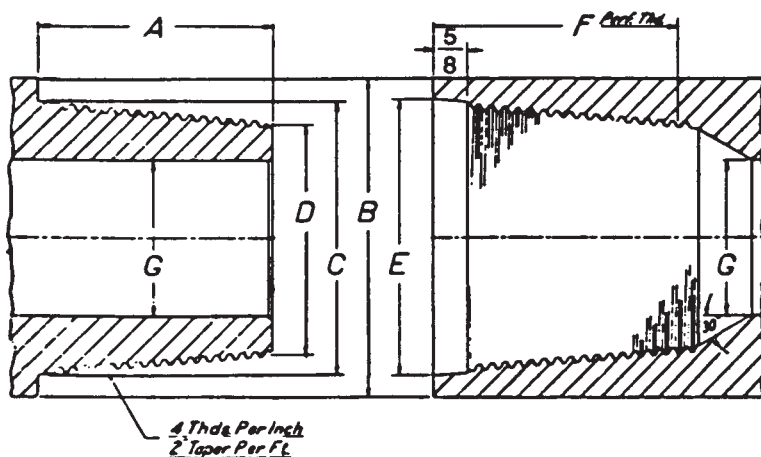


### A.P.I. FULL HOLE

| Size  | A              | B              | C                | D                | E                | F              | G               | H   | K         |
|-------|----------------|----------------|------------------|------------------|------------------|----------------|-----------------|-----|-----------|
|       | in<br>mm       | in<br>mm       | in<br>mm         | in<br>mm         | in<br>mm         | in<br>mm       | in<br>mm        | TPI | TPF       |
| 2 3/8 | 3<br>76.2      | 3 3/8<br>85.7  | 2 25/32<br>70.6  | 2 1/32<br>51.6   | 2 13/16<br>71.4  | 3 1/2<br>88.9  | 1 7/16<br>36.5  | 5   | 3<br>76.2 |
| 2 7/8 | 3 1/2<br>88.9  | 4 1/4<br>108.0 | 3 5/8<br>92.1    | 2 15/32<br>62.7  | 3 13/32<br>86.5  | 4<br>101.6     | 2 1/8<br>54.0   | 5   | 3<br>76.2 |
| 3 1/2 | 3 3/4<br>95.3  | 4 5/8<br>117.5 | 4<br>101.6       | 3 1/16<br>77.8   | 4 3/64<br>102.8  | 4 1/4<br>108.0 | 2 1/8<br>54.0   | 5   | 3<br>76.2 |
| 4 ^   | 4 1/2<br>114.3 | 5 1/4<br>133.4 | 4 9/32<br>108.7  | 3 17/32<br>89.7  | 4 11/32<br>110.3 | 4 7/8<br>123.8 | 2 13/16<br>71.4 | 4   | 2<br>50.8 |
| 4 1/2 | 4<br>101.6     | 5 3/4<br>146.1 | 4 51/64<br>121.8 | 3 51/64<br>96.4  | 4 7/8<br>123.8   | 4 1/2<br>114.3 | 3<br>76.2       | 5   | 3<br>76.2 |
| 5 1/2 | 5<br>127.0     | 7<br>177.8     | 5 33/64<br>140.1 | 5<br>127.0       | 5 29/32<br>150.0 | 5 1/2<br>139.7 | 4<br>101.6      | 4   | 2<br>50.8 |
| 6 5/8 | 5<br>127.0     | 8<br>203.2     | 6 3/4<br>171.5   | 5 59/64<br>150.4 | 6 27/32<br>173.8 | 5 1/2<br>139.7 | 5<br>127.0      | 4   | 2<br>50.8 |

^ Thread portion same as 4 1/2" Reed Double Streamline

## A.P.I. INTERNAL FLUSH (IF) DIMENSIONAL DATA



## A.P.I. INTERNAL FLUSH

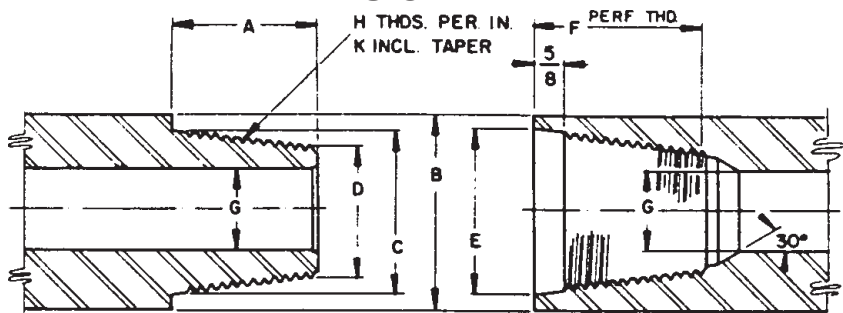
| Size     | A              | B              | C                | D               | E                | F              | G                |
|----------|----------------|----------------|------------------|-----------------|------------------|----------------|------------------|
|          | in             | in             | in               | in              | in               | in             | in               |
|          | mm             | mm             | mm               | mm              | mm               | mm             | mm               |
| 2 3/8    | 3<br>76.2      | 3 3/8<br>85.7  | 2 7/8<br>73.0    | 2 3/8<br>60.3   | 2 15/16<br>74.6  | 3 1/2<br>88.9  | 1 3/4<br>44.5    |
| 2 7/8    | 3 1/2<br>88.9  | 4 1/8<br>104.8 | 3 25/64<br>86.1  | 2 13/16<br>71.4 | 3 29/64<br>87.7  | 4<br>101.6     | 2 1/8<br>54.0    |
| 3 1/2    | 4<br>101.6     | 4 3/4<br>120.7 | 4 1/64<br>102.0  | 3 11/32<br>84.9 | 4 5/64<br>103.6  | 4 1/2<br>114.3 | 2 11/16<br>68.3  |
| 4 *      | 4 1/2<br>114.3 | 5 3/4<br>146.1 | 4 27/32<br>123.0 | 4 3/32<br>104.0 | 4 29/32<br>124.6 | 5<br>127.0     | 3 1/4<br>82.6    |
| 4 1/2 ** | 4 1/2<br>114.3 | 6 1/8<br>155.6 | 5 1/4<br>133.4   | 4 1/2<br>114.3  | 5 5/16<br>134.9  | 5<br>127.0     | 3 3/4<br>95.3    |
| 5 1/2    | 5<br>127.0     | 7 3/8<br>187.3 | 6 13/32<br>162.7 | 5 9/16<br>141.3 | 6 29/64<br>163.9 | 5 1/2<br>139.7 | 4 13/16<br>122.2 |
| 6 5/8    | 5<br>127.0     | 8 1/2<br>215.9 | 7 29/64<br>189.3 | 6 5/8<br>168.3  | 7 31/64<br>190.1 | 5 1/2<br>139.7 | 5 29/32<br>150.0 |

\* Threaded portion same as 4 1/2" Hughes Xtra Hole & 5" Double Streamline

\*\* Threaded portion same as 5 1/2" same as Reed Double Streamline.



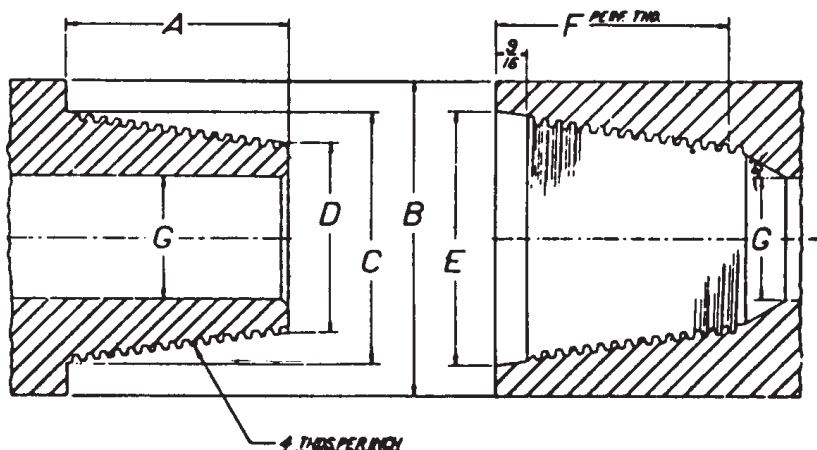
## A.P.I. NUMBERED CONNECTIONS DIMENSIONAL DATA



| Size | A              | B               | C              | D              | E                | F              | G               | H   | K     |
|------|----------------|-----------------|----------------|----------------|------------------|----------------|-----------------|-----|-------|
|      | in<br>mm       | in<br>mm        | in<br>mm       | in<br>mm       | in<br>mm         | in<br>mm       | in<br>mm        | TPI | TPF   |
| NC10 | 1 1/2<br>38.1  | 1 3/8<br>34.9   | 1.190<br>30.2  | 1.002<br>25.5  | 1.204<br>30.6    | 2 1/8<br>54.0  | 0.719<br>18.3   | 6   | 1 1/2 |
| NC12 | 1 3/4<br>44.5  | 1 5/8<br>41.3   | 1.392<br>35.4  | 1.173<br>29.8  | 1.406<br>35.7    | 2 3/8<br>60.3  | 0.906<br>23.0   | 6   | 1 1/2 |
| NC13 | 1 3/4<br>44.5  | 1 13/16<br>46.0 | 1.518<br>38.6  | 1.299<br>33.0  | 1.532<br>38.9    | 2 3/8<br>60.3  | 0.937<br>23.8   | 6   | 1 1/2 |
| NC16 | 1 3/4<br>44.5  | 2 1/8<br>54.0   | 1.736<br>44.1  | 1.517<br>38.5  | 1.751<br>44.5    | 2 3/8<br>60.3  | 1.000<br>25.4   | 6   | 1 1/2 |
| NC23 | 3<br>76.2      | 3 1/8<br>79.4   | 2.563<br>65.1  | 2.063<br>52.4  | 2 5/8<br>66.7    | 3 5/8<br>92.1  | 1 1/4<br>31.8   | 4   | 2     |
| NC26 | 3<br>76.2      | 3 3/8<br>85.7   | 2.876<br>73.1  | 2.376<br>60.4  | 2 15/16<br>74.6  | 3 5/8<br>92.1  | 1 3/4<br>44.5   | 4   | 2     |
| NC31 | 3 1/2<br>88.9  | 4 1/8<br>104.8  | 3.391<br>86.1  | 2.808<br>71.3  | 3 29/64<br>87.7  | 4 1/8<br>104.8 | 2 1/8<br>54.0   | 4   | 2     |
| NC35 | 3 3/4<br>95.3  | 4 3/4<br>120.7  | 3.739<br>95.0  | 3.114<br>79.1  | 3 13/16<br>96.8  | 4 3/8<br>111.1 | 2 1/4<br>57.2   | 4   | 2     |
| NC38 | 4<br>101.6     | 4 3/4<br>120.7  | 4.016<br>102.0 | 3.349<br>85.1  | 4 5/64<br>103.6  | 4 5/8<br>117.5 | 2 11/16<br>68.3 | 4   | 2     |
| NC40 | 4 1/2<br>114.3 | 5 1/4<br>133.4  | 4.280<br>108.7 | 3.530<br>89.7  | 4 11/32<br>110.3 | 5 1/8<br>130.2 | 2 13/16<br>71.4 | 4   | 2     |
| NC44 | 4 1/2<br>114.3 | 5 3/4<br>146.1  | 4.625<br>117.5 | 3.875<br>98.4  | 4 11/16<br>119.1 | 5 1/8<br>130.2 | 3 1/8<br>79.4   | 4   | 2     |
| NC46 | 4 1/2<br>114.3 | 6<br>152.4      | 4.834<br>122.8 | 4.084<br>103.7 | 4 29/32<br>124.6 | 5 1/8<br>130.2 | 3 1/4<br>82.6   | 4   | 2     |
| NC50 | 4 1/2<br>114.3 | 6 3/8<br>161.9  | 5.250<br>133.4 | 4.500<br>114.3 | 5 5/16<br>134.9  | 5 1/8<br>130.2 | 3 3/4<br>95.3   | 4   | 2     |
| NC56 | 5<br>127.0     | 7<br>177.8      | 5.876<br>149.3 | 4.626<br>117.5 | 5 15/16<br>150.8 | 5 5/8<br>142.9 | 3 3/4<br>95.3   | 4   | 3     |
| NC61 | 5 1/2<br>139.7 | 8<br>203.2      | 6.438<br>163.5 | 5.063<br>128.6 | 6 1/2<br>165.1   | 6 1/8<br>155.6 | 4<br>101.6      | 4   | 3     |
| NC70 | 6<br>152.4     | 9 1/4<br>235.0  | 7.313<br>185.8 | 5.813<br>147.7 | 7 3/8<br>187.3   | 6 5/8<br>168.3 | 4 1/2<br>114.3  | 4   | 3     |
| NC77 | 6 1/2<br>165.1 | 10 3/4<br>273.1 | 8.000<br>203.2 | 6.376<br>162.0 | 8 1/16<br>204.8  | 7 1/8<br>181.0 | 4 3/4<br>120.7  | 4   | 3     |



## ACME REGULAR DIMENSIONAL DATA



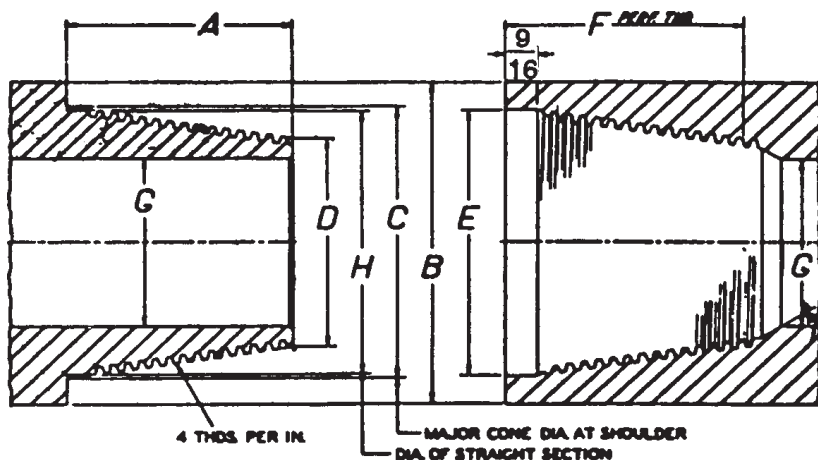
### ACME REGULAR

| Size       | A            | B      | C       | D       | E       | F     | G           |
|------------|--------------|--------|---------|---------|---------|-------|-------------|
|            | in           | in     | in      | in      | in      | in    | in          |
|            | mm           | mm     | mm      | mm      | mm      | mm    | mm          |
| 2 3/8      | 3            | 3 1/8  | 2 19/32 | 1 3/4   | 2 5/8   | 3 1/2 | 1           |
|            | 76.2         | 79.4   | 65.9    | 44.5    | 66.7    | 88.9  | 25.4        |
| 2 7/8      | 3 1/2        | 3 3/4  | 2 63/64 | 2       | 3 1/64  | 3 7/8 | 1 1/4       |
|            | 88.9         | 95.3   | 75.8    | 50.8    | 76.6    | 98.4  | 31.8        |
| 3 1/2      | 3 1/2        | 4 1/4  | 3 17/32 | 2 35/64 | 3 9/16  | 3 7/8 | 1 3/4       |
|            | 88.9         | 108.0  | 89.7    | 64.7    | 90.5    | 98.4  | 44.5        |
| 4 1/2      | 4            | 5 1/2  | 4 39/64 | 3 31/64 | 4 11/16 | 4 3/8 | 2 1/2       |
|            | 101.6        | 139.7  | 117.1   | 88.5    | 119.1   | 111.1 | 63.5        |
| 5 1/2      | 4 1/2        | 6 3/4  | 5 41/64 | 4 3/8   | 5 43/64 | 4 7/8 | 3           |
|            | 114.3        | 171.5  | 143.3   | 111.1   | 144.1   | 123.8 | 76.2        |
| 6 5/8      | 5            | 7 3/4  | 6 27/64 | 5 1/64  | 6 31/64 | 5 3/8 | 3 1/2       |
|            | 127.0        | 196.9  | 163.1   | 127.4   | 164.7   | 136.5 | 88.9        |
| Tolerances | +0.0<br>-1/8 | ± 1/32 | None    | None    | ± 1/64  | None  | +1/32<br>-0 |

3 3/8" taper per foot.



## ACME STREAMLINE / ACME FULL HOLE DIMENSIONAL DATA



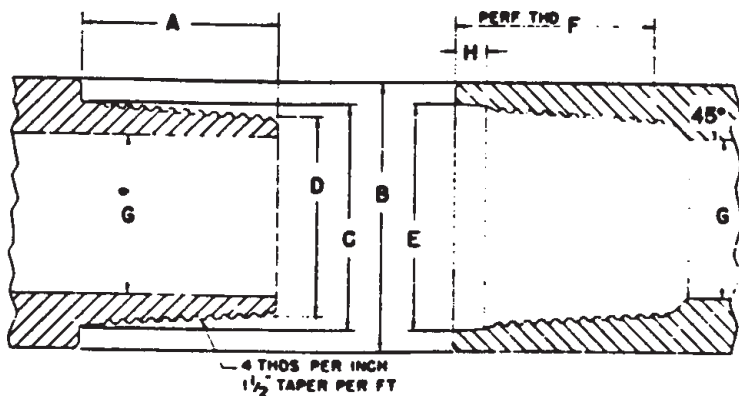
### ACME STREAMLINE & ACME FULL HOLE

| Size  | A              | B              | C                | D                | E                | F              | *G             | H                |
|-------|----------------|----------------|------------------|------------------|------------------|----------------|----------------|------------------|
|       | in             | in             | in               | in               | in               | in             | in             | in               |
|       | mm             | mm             | mm               | mm               | mm               | mm             | mm             | mm               |
| 2 3/8 | 2 7/8<br>73.0  | 3 3/8<br>85.7  | 2 7/8<br>73.0    | 2 1/32<br>51.6   | 2 3/4<br>69.9    | 3 5/8<br>92.1  | 1 7/16<br>36.5 | 2 47/64<br>69.5  |
| 2 7/8 | 3 3/8<br>85.7  | 4<br>101.6     | 3 29/64<br>87.7  | 2 1/2<br>63.5    | 3 1/2<br>88.9    | 3 3/4<br>95.3  | 1 9/16<br>39.7 | 3 5/16<br>84.1   |
| 3 1/2 | 3 3/8<br>85.7  | 4 5/8<br>117.5 | 4<br>101.6       | 3 3/64<br>77.4   | 4 3/64<br>102.8  | 3 3/4<br>95.3  | 2 5/16<br>58.7 | 3 55/64<br>98.0  |
| 4 1/2 | 4<br>101.6     | 5 3/4<br>146.1 | 4 55/64<br>123.4 | 3 47/64<br>94.9  | 4 59/64<br>125.0 | 4 3/8<br>111.1 | 2 7/8<br>73.0  | 4 47/64<br>120.3 |
| 5 1/2 | 4 1/2<br>114.3 | 7<br>177.8     | 5 31/32<br>151.6 | 4 45/64<br>119.5 | 6 1/32<br>153.2  | 4 7/8<br>123.8 | 4<br>101.6     | 5 55/64<br>148.8 |

\* STD Bore

3 3/8" taper per foot.

## AMERICAN IRON OPEN HOLE DIMENSIONAL DATA

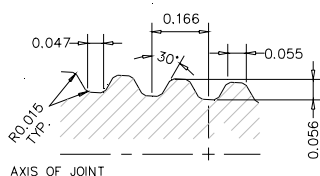
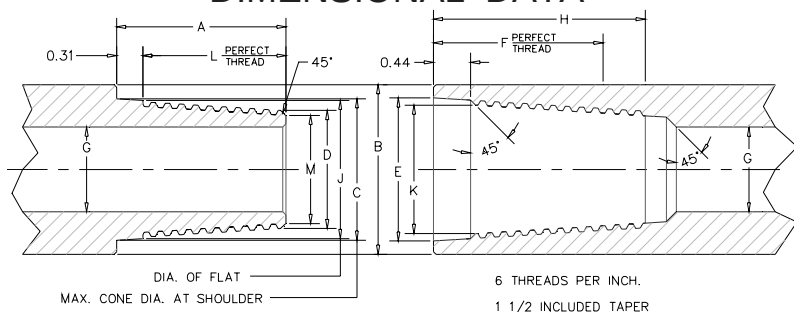


### AMERICAN IRON OPEN HOLE

| Size                         | A             | B              | C                | D                | E                | F              | G               | H           |
|------------------------------|---------------|----------------|------------------|------------------|------------------|----------------|-----------------|-------------|
|                              | in            | in             | in               | in               | in               | in             | in              | in          |
|                              | mm            | mm             | mm               | mm               | mm               | mm             | mm              | mm          |
| <b>DRILL PIPE TOOL JOINT</b> |               |                |                  |                  |                  |                |                 |             |
| 2 3/8                        | 2 3/8<br>60.3 | 3 1/4<br>82.6  | 2 3/4<br>69.9    | 2 29/64<br>62.3  | 2 13/16<br>71.4  | 2 1/2<br>63.5  | 1 13/16<br>46.0 | 3/8<br>9.5  |
| 2 7/8                        | 2 7/8<br>73.0 | 3 7/8<br>98.4  | 3 9/64<br>79.8   | 2 25/32<br>70.6  | 3 7/32<br>81.8   | 3<br>76.2      | 2.151<br>54.6   | 3/8<br>9.5  |
| 3 1/2                        | 3 1/4<br>82.6 | 4 3/4<br>120.7 | 3 57/64<br>98.8  | 3 31/64<br>88.5  | 3 61/64<br>100.4 | 3 3/8<br>85.7  | 2 11/16<br>68.3 | 5/8<br>15.9 |
| 4                            | 4<br>101.6    | 5 1/2<br>139.7 | 4 37/64<br>116.3 | 4 5/64<br>103.6  | 4 41/64<br>117.9 | 4 1/8<br>104.8 | 3 1/4<br>82.6   | 5/8<br>15.9 |
| <b>TUBING TOOL JOINT</b>     |               |                |                  |                  |                  |                |                 |             |
| 2 3/8                        | 2 3/8<br>60.3 | 3 1/8<br>79.4  | 2 3/4<br>69.9    | 2 29/64<br>62.3  | 2 13/16<br>71.4  | 2 1/2<br>63.5  | 1.995<br>50.7   | 3/8<br>9.5  |
| 2 7/8                        | 2 1/2<br>63.5 | 3 3/4<br>95.3  | 3 9/64<br>79.8   | 2 53/64<br>71.8  | 3 7/32<br>81.8   | 3<br>76.2      | 2.441<br>62.0   | 3/8<br>9.5  |
| 3 1/2                        | 3 1/4<br>82.6 | 4 1/2<br>114.3 | 3 57/64<br>98.8  | 3 31/64<br>88.5  | 3 61/64<br>100.4 | 3 3/8<br>85.7  | 2.992<br>76.0   | 5/8<br>15.9 |
| 4                            | 3 1/2<br>88.9 | 5 1/4<br>133.4 | 4 37/64<br>116.3 | 4 9/64<br>105.2  | 4 41/64<br>117.9 | 4 1/8<br>104.8 | 3.476<br>88.3   | 5/8<br>15.9 |
| 4 1/2                        | 3 3/4<br>95.3 | 5 3/4<br>146.1 | 4 59/64<br>125.0 | 4 29/64<br>113.1 | 4 63/64<br>126.6 | 3 7/8<br>98.4  | 3.958<br>100.5  | 5/8<br>15.9 |



## AMERICAN MACARONI TUBING (AM-MT) DIMENSIONAL DATA



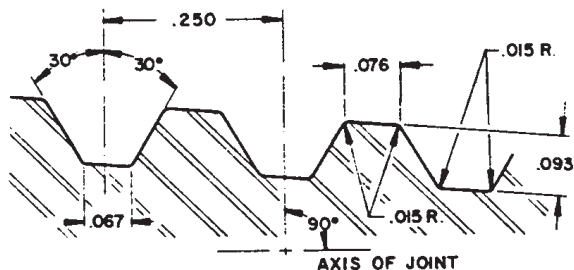
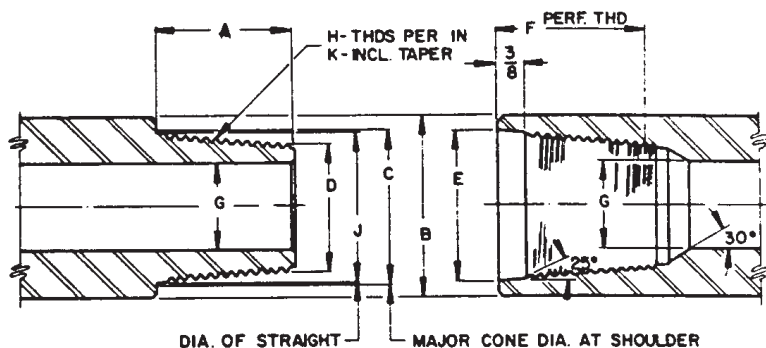
## AMERICAN MT

| Size  | A     | B      | C     | D     | E     | F     | G    | H     | J     | K     | L     | M      |
|-------|-------|--------|-------|-------|-------|-------|------|-------|-------|-------|-------|--------|
|       | in    | in     | in    | in    | in    | in    | in   | in    | in    | in    | in    | in     |
|       | mm    | mm     | mm    | mm    | mm    | mm    | mm   | mm    | mm    | mm    | mm    | mm     |
| 1     | 1 1/2 | 1 9/16 | 1.281 | 1.093 | 1.301 | 1 1/2 | 3/4  | 2     | 1.233 | 1.183 | 1 1/8 | 61/64  |
|       | 38.1  | 39.7   | 32.5  | 27.8  | 33.0  | 38.1  | 19.1 | 50.8  | 31.3  | 30.0  | 28.6  | 24.2   |
| 1 1/4 | 2     | 1 3/4  | 1.468 | 1.218 | 1.483 | 2     | 7/8  | 2 1/2 | 1.421 | 1.371 | 1 5/8 | 1 1/16 |
|       | 50.8  | 44.5   | 37.3  | 30.9  | 37.7  | 50.8  | 22.2 | 63.5  | 36.1  | 34.8  | 41.3  | 27.0   |
| 1 1/2 | 2     | 2      | 1.668 | 1.418 | 1.688 | 2     | 1    | 2 1/2 | 1.621 | 1.570 | 1 5/8 | 1 9/32 |
|       | 50.8  | 50.8   | 42.4  | 36.0  | 42.9  | 50.8  | 25.4 | 63.5  | 41.2  | 39.9  | 41.3  | 32.5   |





## AMERICAN P.A.C. (PAC) DIMENSIONAL DATA

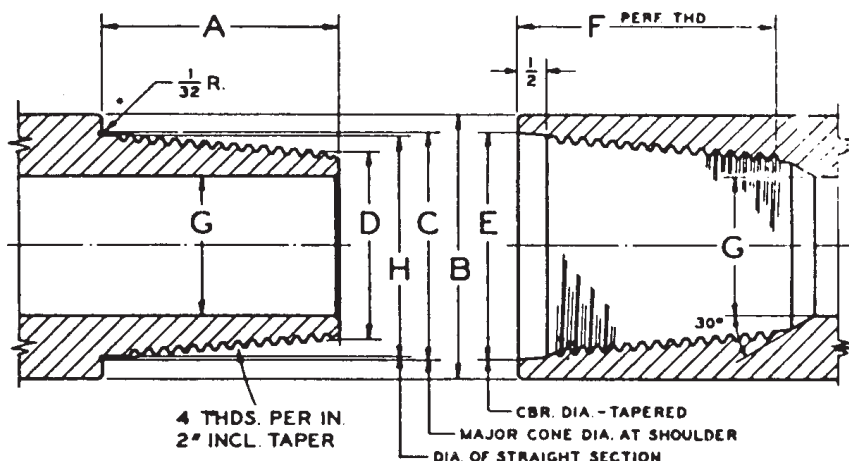


## AMERICAN P.A.C.

| Size  | A     | B     | C       | D       | E       | F     | G     | H   | J       | K     |
|-------|-------|-------|---------|---------|---------|-------|-------|-----|---------|-------|
|       | in    | in    | in      | in      | in      | in    | in    | TPI | in      | TPF   |
|       | mm    | mm    | mm      | mm      | mm      | mm    | mm    |     | mm      |       |
| 2 3/8 | 2 3/8 | 2 7/8 | 2 23/64 | 2 1/16  | 2 27/64 | 2 1/2 | 1 3/8 | 4   | 2 5/16  | 1 1/2 |
|       | 60.3  | 73.0  | 59.9    | 52.4    | 61.5    | 63.5  | 34.9  |     | 58.7    |       |
| 2 7/8 | 2 3/8 | 3 1/8 | 2 17/32 | 2 15/64 | 2 19/32 | 2 1/2 | 1 1/2 | 4   | 2 31/64 | 1 1/2 |
|       | 60.3  | 79.4  | 64.3    | 56.8    | 65.9    | 63.5  | 38.1  |     | 63.1    |       |
| 3 1/2 | 3 1/4 | 3 3/4 | 3 3/64  | 2 41/64 | 3 7/64  | 3 3/8 | 2     | 4   | 3       | 1 1/2 |
|       | 82.6  | 95.3  | 77.4    | 67.1    | 79.0    | 85.7  | 50.8  |     | 76.2    |       |



## HUGHES DOUBLE STREAMLINE DIMENSIONAL DATA



### HUGHES DOUBLE STREAMLINE

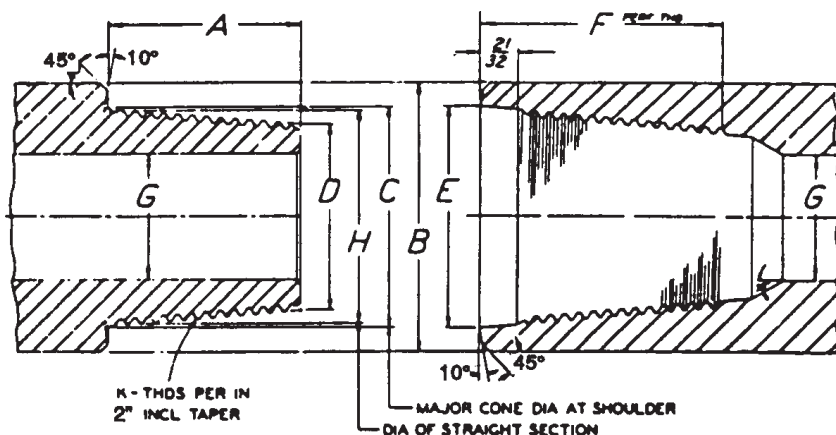
| Size    | A              | B              | C               | D               | E               | F              | G               | H               |
|---------|----------------|----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|
|         | in             | in             | in              | in              | in              | in             | in              | in              |
|         | mm             | mm             | mm              | mm              | mm              | mm             | mm              | mm              |
| 3 1/2 ① | 3 7/8<br>98.4  | 3 7/8<br>98.4  | 3 21/64<br>84.5 | 2 11/16<br>68.3 | 3 23/64<br>85.3 | 4 1/4<br>108.0 | 1 13/16<br>46.0 | 3 15/64<br>82.2 |
| 4 ②     | 4<br>101.6     | 4 1/2<br>114.3 | 3 57/64<br>98.8 | 3 7/32<br>81.8  | 3 59/64<br>99.6 | 4 3/8<br>111.1 | 2 3/8<br>60.3   | 3 51/64<br>96.4 |
| 4 1/2 ③ | 4 1/2<br>114.3 | 5<br>127.0     | 4 9/32<br>108.7 | 3 17/32<br>89.7 | 4 5/16<br>109.5 | 4 7/8<br>123.8 | 2 11/16<br>68.3 | 4 3/16<br>106.4 |

① Threaded portion same as 2 7/8" Xtra Hole and 3 1/2" Reed Double Streamline.

② Threaded portion same as 4" Reed Double Streamline.

③ Threaded portion same as 4 1/2" Reed Double Streamline.

## HUGHES EXTERNAL FLUSH (HEF) DIMENSIONAL DATA



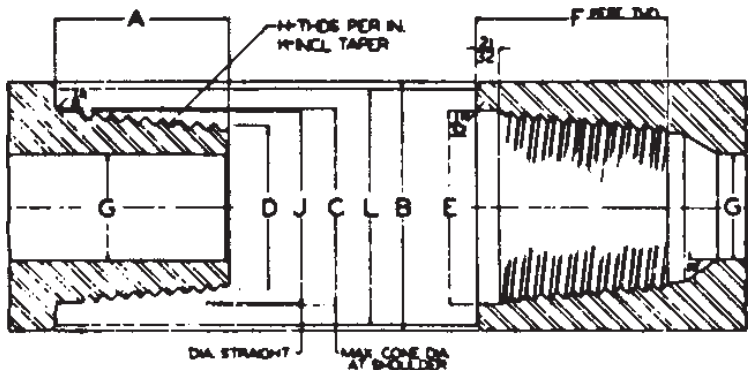
### HUGHES EXTERNAL FLUSH

| Size    | A             | B                | C               | D               | E                  | F              | G              | H              | K   |
|---------|---------------|------------------|-----------------|-----------------|--------------------|----------------|----------------|----------------|-----|
|         | in            | in               | in              | in              | in                 | in             | in             | in             | TPI |
|         | mm            | mm               | mm              | mm              | mm                 | mm             | mm             | mm             |     |
| 2 3/8 ③ | 2 3/8<br>60.3 | 2 1/2<br>63.5    | 2 7/64<br>53.6  | 1 23/32<br>43.7 | 2 1/16 *<br>52.4 * | 3 1/4<br>82.6  | 1<br>25.4      | 2 1/64<br>51.2 | 6   |
| 2 7/8   | 2 5/8<br>66.7 | 3<br>76.2        | 2 1/2<br>63.5   | 2 1/16<br>52.4  | 2 17/32<br>64.3    | 3<br>76.2      | 1 1/16<br>27.0 | -              | 6   |
| 3 1/2 ① | 3 1/4<br>82.6 | 3 5/8<br>92.1    | 3<br>76.2       | 2 29/64<br>62.3 | 3 1/32<br>77.0     | 4<br>101.6     | 1 1/2<br>38.1  | -              | 4   |
| 3 1/2 ① | 3 1/4<br>82.6 | 3 11/16<br>93.7  | 3<br>76.2       | 2 29/64<br>62.3 | 3 1/32<br>77.0     | 4<br>101.6     | 1 1/2<br>38.1  | -              | 4   |
| 4 1/2 ② | 3 3/8<br>85.7 | 4 11/16<br>119.1 | 3 13/16<br>96.8 | 3 1/4<br>82.6   | 3 7/8<br>98.4      | 4 1/4<br>108.0 | 2 3/16<br>55.6 | -              | 4   |
| 4 1/2 ② | 3 3/8<br>85.7 | 4 17/32<br>115.1 | 3 13/16<br>96.8 | 3 1/4<br>82.6   | 3 7/8<br>98.4      | 4 1/4<br>108.0 | 2 3/16<br>55.6 | -              | 4   |

- ① Threaded portion same as or interchanges with 3 1/2" F.H. Reed External Flush.  
 ② Threaded portion same as or interchanges with 4 1/2" F.H. Reed External Flush,  
 3 1/2" Hughes Xtra Hole and 4" Hughes Slim Hole.  
 ③ Threaded portion same as or interchanges with 2 3/8" Homco (External Flush)  
 "Little Inch".  
 \* Straight Counterbore.



## HUGHES H-90 DIMENSIONAL DATA



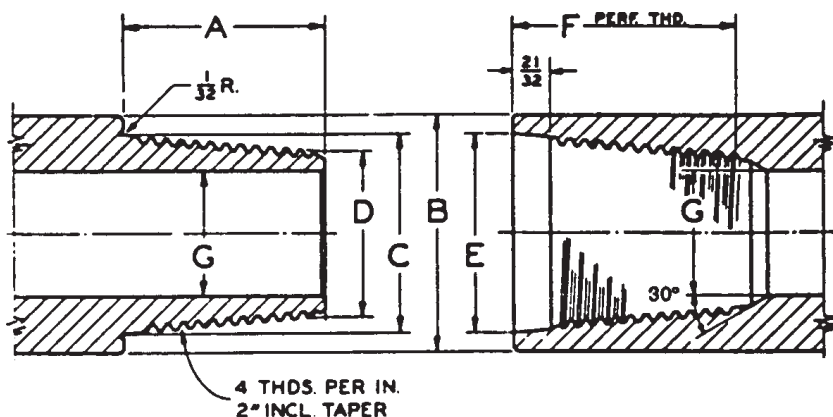
| Size  | A              | B              | C              | D              | E                | F                | G                            | H     | J                | K   | L                |
|-------|----------------|----------------|----------------|----------------|------------------|------------------|------------------------------|-------|------------------|-----|------------------|
|       | in             | in             | in             | in             | in               | in               | in                           | TPI   | in               | TPF | in               |
|       | mm             | mm             | mm             | mm             | mm               | mm               | mm                           |       | mm               |     | mm               |
| 3 1/2 | 3 7/8<br>98.4  | 5              | 4.125<br>104.8 | 3.479<br>88.4  | 4 3/16<br>106.4  | 4 7/16<br>112.7  | 2 5/8 - 2 3/4<br>66.7 - 69.9 | 3 1/2 | 3 15/16<br>100.0 | 2   | 4 13/16<br>122.2 |
|       |                | 5 1/8<br>130.2 |                |                |                  |                  | 2 1/2 - 2 3/4<br>63.5 - 69.9 |       |                  |     | 4 13/16<br>122.2 |
|       |                | 5 1/4<br>133.4 |                |                |                  |                  | 2 - 2 5/8<br>50.8 - 66.7     |       |                  |     | 5                |
|       |                | 5 3/8<br>136.5 |                |                |                  |                  | 2 - 2 1/4<br>50.8 - 57.2     |       |                  |     | 5                |
|       |                | 5 1/2<br>139.7 |                |                |                  |                  | 2 - 2 1/8<br>50.8 - 54.0     |       |                  |     | 5                |
|       |                | 5 1/2<br>139.7 |                |                |                  |                  | 2 7/8 - 3<br>73.0 - 76.2     |       |                  |     | 5 5/16<br>134.9  |
|       |                | 5 5/8<br>142.9 |                |                |                  |                  | 2 1/2 - 2 7/8<br>63.5 - 73.0 |       |                  |     | 5 5/16<br>134.9  |
|       |                | 5 3/4<br>146.1 |                |                |                  |                  | 2 1/4 - 2 7/8<br>57.2 - 73.0 |       |                  |     | 5 1/2<br>139.7   |
| 4     | 4 1/8<br>104.8 | 5 7/8<br>149.2 | 4.500<br>114.3 | 3.813<br>96.9  | 4 9/16<br>115.9  | 4 11/16<br>119.1 | 2 - 2 3/4<br>50.8 - 69.9     | 3 1/2 | 4 5/16<br>109.5  | 2   | 5 1/2<br>139.7   |
|       |                | 6<br>152.4     |                |                |                  |                  | 2 - 2 1/2<br>50.8 - 63.5     |       |                  |     | 5 1/2<br>139.7   |
|       |                | 6 1/8<br>155.6 |                |                |                  |                  | 3 - 3 1/4<br>76.2 - 82.6     |       |                  |     | 5 3/4<br>146.1   |
|       |                | 6 1/4<br>158.8 |                |                |                  |                  | 2 3/4 - 3<br>69.9 - 76.2     |       |                  |     | 5 3/4<br>146.1   |
|       |                | 6 3/8<br>161.9 |                |                |                  |                  | 2 1/2 - 3<br>63.5 - 76.2     |       |                  |     | 6                |
|       |                | 6 1/2<br>165.1 |                |                |                  |                  | 2 - 3<br>50.8 - 76.2         |       |                  |     | 6                |
|       |                | 6 1/2<br>165.1 |                |                |                  |                  | 2 - 2 3/4<br>50.8 - 69.9     |       |                  |     | 6                |
|       |                | 6 1/2<br>165.1 |                |                |                  |                  | 2 7/8 - 3 3/4<br>73.0 - 95.3 |       |                  |     | 6 1/8<br>155.6   |
| 4 1/2 | 4 3/8<br>111.1 | 6 1/4<br>158.8 | 4.834<br>122.8 | 4.105<br>104.3 | 4 57/64<br>124.2 | 4 15/16<br>125.4 | 2 1/2 - 3<br>63.5 - 76.2     | 3 1/2 | 4 41/64<br>117.9 | 2   | 6<br>152.4       |
|       |                | 6 3/8<br>161.9 |                |                |                  |                  | 2 - 3<br>50.8 - 76.2         |       |                  |     | 6<br>152.4       |
|       |                | 6 1/2<br>165.1 |                |                |                  |                  | 2 - 2 3/4<br>50.8 - 69.9     |       |                  |     | 6<br>152.4       |
|       |                | 6 1/2<br>165.1 |                |                |                  |                  | 2 7/8 - 3 3/4<br>73.0 - 95.3 |       |                  |     | 6 1/8<br>155.6   |
|       |                | 6 5/8<br>168.3 |                |                |                  |                  | 2 1/2 - 3<br>63.5 - 76.2     |       |                  |     | 6 1/8<br>155.6   |
|       |                | 6 3/4<br>171.5 |                |                |                  |                  | 2 1/4 - 3<br>57.2 - 76.2     |       |                  |     | 6 3/8<br>161.9   |
|       |                | 6 7/8<br>174.6 |                |                |                  |                  | 2 1/4 - 2 3/4<br>57.2 - 69.9 |       |                  |     | 6 3/8<br>161.9   |
|       |                | 7<br>177.8     |                |                |                  |                  | 2 1/2<br>63.5                |       |                  |     | 6 3/8<br>161.9   |
| 5     | 4 5/8<br>117.5 | 6 1/2<br>165.1 | 5.104<br>129.6 | 4.334<br>110.1 | 5 5/32<br>131.0  | 5 3/16<br>131.8  | 2 7/8 - 3 3/4<br>73.0 - 95.3 | 3 1/2 | 4 59/64<br>125.0 | 2   | 6 1/8<br>155.6   |
|       |                | 6 5/8<br>168.3 |                |                |                  |                  | 2 1/2 - 3<br>63.5 - 76.2     |       |                  |     | 6 1/8<br>155.6   |
|       |                | 6 3/4<br>171.5 |                |                |                  |                  | 2 1/4 - 3<br>57.2 - 76.2     |       |                  |     | 6 3/8<br>161.9   |
|       |                | 6 7/8<br>174.6 |                |                |                  |                  | 2 1/4 - 2 3/4<br>57.2 - 69.9 |       |                  |     | 6 3/8<br>161.9   |
|       |                | 7<br>177.8     |                |                |                  |                  | 2 1/2<br>63.5                |       |                  |     | 6 3/8<br>161.9   |
|       |                | 7<br>177.8     |                |                |                  |                  | 2 1/2<br>63.5                |       |                  |     | 6 3/8<br>161.9   |
|       |                | 7<br>177.8     |                |                |                  |                  | 2 1/2<br>63.5                |       |                  |     | 6 3/8<br>161.9   |
|       |                | 7<br>177.8     |                |                |                  |                  | 2 1/2<br>63.5                |       |                  |     | 6 3/8<br>161.9   |

## HUGHES H-90 DIMENSIONAL DATA

| Size  | A              | B               | C              | D              | E               | F                | G                            | H     | J                | K   | L               |
|-------|----------------|-----------------|----------------|----------------|-----------------|------------------|------------------------------|-------|------------------|-----|-----------------|
|       | in<br>mm       | in<br>mm        | in<br>mm       | in<br>mm       | in<br>mm        | in<br>mm         | in<br>mm                     | TPI   | in<br>mm         | TPF | in<br>mm        |
| 5 1/2 | 4 5/8<br>117.5 | 6 3/4<br>171.5  | 5.375<br>136.5 | 4.604<br>116.9 | 5 7/16<br>138.1 | 5 3/16<br>131.8  | 3 1/8 - 3 3/8<br>79.4 - 85.7 | 3 1/2 | 5 3/16<br>131.8  | 2   | 6 3/8<br>161.9  |
|       |                | 6 7/8<br>174.6  |                |                |                 |                  | 3 - 3 1/4<br>76.2 - 82.6     |       |                  |     | 6 5/8<br>168.3  |
|       |                | 7<br>177.8      |                |                |                 |                  | 2 3/4 - 3 1/4<br>69.9 - 82.6 |       |                  |     | 6 5/8<br>168.3  |
|       |                | 7 1/8<br>181.0  |                |                |                 |                  | 2 1/4 - 3 1/4<br>57.2 - 82.6 |       |                  |     | 6 5/8<br>168.3  |
|       |                | 7 1/4<br>184.2  |                |                |                 |                  | 2 1/4 - 3<br>57.2 - 76.2     |       |                  |     | 6 5/8<br>168.3  |
|       |                | 7 3/8<br>187.3  |                |                |                 |                  | 2 1/4 - 2 3/4<br>57.2 - 69.9 |       |                  |     | 6 5/8<br>168.3  |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
| 6 5/8 | 4 7/8<br>123.8 | 7 1/2<br>190.5  | 6.000<br>152.4 | 5.188<br>131.8 | 6 1/16<br>154.0 | 5 11/64<br>131.4 | 2 1/4 - 2 1/2<br>57.2 - 63.5 | 3 1/2 | 5 13/16<br>147.6 | 2   | 6 5/8<br>168.3  |
|       |                | 7 5/8<br>193.7  |                |                |                 |                  | 3 3/8<br>85.7                |       |                  |     | 7 1/4<br>184.2  |
|       |                | 7 3/4<br>196.9  |                |                |                 |                  | 3 1/4 - 3 1/2<br>82.6 - 88.9 |       |                  |     | 7 1/2<br>190.5  |
|       |                | 7 7/8<br>200.0  |                |                |                 |                  | 3 - 3 1/2<br>76.2 - 88.9     |       |                  |     | 7 1/2<br>190.5  |
|       |                | 8<br>203.2      |                |                |                 |                  | 2 1/2 - 3 1/2<br>63.5 - 88.9 |       |                  |     | 7 1/2<br>190.5  |
|       |                | 8 1/8<br>206.4  |                |                |                 |                  | 2 1/2 - 3 1/4<br>63.5 - 82.6 |       |                  |     | 7 1/2<br>190.5  |
|       |                | 8 1/4<br>209.6  |                |                |                 |                  | 2 1/2 - 3<br>63.5 - 76.2     |       |                  |     | 7 1/2<br>190.5  |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
| 7     | 5 3/8<br>136.5 | 8 1/4<br>209.6  | 6.500<br>165.1 | 5.156<br>131.0 | 7 1/8<br>181.0  | 5 15/16<br>150.8 | 3 1/2 - 3 3/4<br>88.9 - 95.3 | 3 1/2 | 6 3/8<br>161.9   | 3   | 8<br>203.2      |
|       |                | 8 3/8<br>212.7  |                |                |                 |                  | 2 3/4 - 3 3/4<br>69.9 - 95.3 |       |                  |     | 8<br>203.2      |
|       |                | 8 1/2<br>215.9  |                |                |                 |                  | 2 3/4 - 3 3/4<br>69.9 - 95.3 |       |                  |     | 8 1/4<br>209.6  |
|       |                | 8 5/8<br>219.1  |                |                |                 |                  | 2 3/4 - 3 1/2<br>69.9 - 88.9 |       |                  |     | 8 1/4<br>209.6  |
|       |                | 8 3/4<br>222.3  |                |                |                 |                  | 2 3/4 - 3 1/4<br>69.9 - 82.6 |       |                  |     | 8 1/4<br>209.6  |
|       |                | 9<br>228.6      |                |                |                 |                  | 2 3/4 - 3<br>69.9 - 76.2     |       |                  |     | 8 5/8<br>219.1  |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
| 7 5/8 | 6<br>152.4     | 9 1/2<br>241.3  | 7.389<br>187.7 | 5.889<br>149.6 | 8<br>203.2      | 6 9/16<br>166.7  | 3 1/2 - 4<br>88.9 - 101.6    | 3 1/2 | 7 17/64<br>184.5 | 3   | 9 1/4<br>235.0  |
|       |                | 9 5/8<br>244.5  |                |                |                 |                  | 3 - 4<br>76.2 - 101.6        |       |                  |     | 9 1/4<br>235.0  |
|       |                | 9 3/4<br>247.7  |                |                |                 |                  | 3 - 4<br>76.2 - 101.6        |       |                  |     | 9 1/4<br>235.0  |
|       |                | 9 7/8<br>250.8  |                |                |                 |                  | 3 - 4<br>76.2 - 101.6        |       |                  |     | 9 5/8<br>244.5  |
|       |                | 10<br>254.0     |                |                |                 |                  | 3 - 3 3/4<br>76.2 - 95.3     |       |                  |     | 9 5/8<br>244.5  |
|       |                | 10 1/4<br>260.4 |                |                |                 |                  | 3 - 3 1/4<br>76.2 - 82.6     |       |                  |     | 9 5/8<br>244.5  |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |
| 8 5/8 | 6 1/2<br>165.1 | 10 3/4<br>273.1 | 8.264<br>209.9 | 6.639<br>168.6 | 9 3/8<br>238.1  | 7 1/16<br>179.4  | 3 1/2 - 4<br>88.9 - 101.6    | 3 1/2 | 8 9/64<br>206.8  | 3   | 10 1/2<br>266.7 |
|       |                | 11<br>279.4     |                |                |                 |                  | 3 - 4<br>76.2 - 101.6        |       |                  |     | 10 1/2<br>266.7 |
|       |                | 11 1/4<br>285.8 |                |                |                 |                  | 3 - 4<br>76.2 - 101.6        |       |                  |     | 10 3/4<br>273.1 |
|       |                | 11 1/2<br>292.1 |                |                |                 |                  | 3 - 3 3/4<br>76.2 - 95.3     |       |                  |     | 10 3/4<br>273.1 |
|       |                |                 |                |                |                 |                  |                              |       |                  |     |                 |



## HUGHES SLIM HOLE (SH) DIMENSIONAL DATA



## HUGHES SLIM HOLE

| Size    | A             | B              | C               | D               | E               | F              | G               |
|---------|---------------|----------------|-----------------|-----------------|-----------------|----------------|-----------------|
|         | in<br>mm      | in<br>mm       | in<br>mm        | in<br>mm        | in<br>mm        | in<br>mm       | in<br>mm        |
| 2 3/8   | 2 7/8<br>73.0 | 2 7/8<br>73.0  | 2 7/16<br>61.9  | 1 61/64<br>49.6 | 2 1/2<br>63.5   | 3 1/8<br>79.4  | 1 1/4<br>31.8   |
| 2 7/8 ① | 2 7/8<br>73.0 | 3 3/8<br>85.7  | 2 7/8<br>73.0   | 2 25/64<br>60.7 | 2 15/16<br>74.6 | 3 1/8<br>79.4  | 1 3/4<br>44.5   |
| 3 1/2 ② | 3 3/8<br>85.7 | 4 1/8<br>104.8 | 3 25/64<br>86.1 | 2 53/64<br>71.8 | 3 29/64<br>87.7 | 3 5/8<br>92.1  | 2 1/8<br>54.0   |
| 4 ③     | 3 3/8<br>85.7 | 4 5/8<br>117.5 | 3 13/16<br>96.8 | 3 1/4<br>82.6   | 3 7/8<br>98.4   | 3 5/8<br>92.1  | 2 9/16<br>65.1  |
| 4 1/2 ④ | 3 7/8<br>98.4 | 5<br>127.0     | 4 1/64<br>102.0 | 3 3/8<br>85.7   | 4 5/64<br>103.6 | 4 1/4<br>108.0 | 2 11/16<br>68.3 |

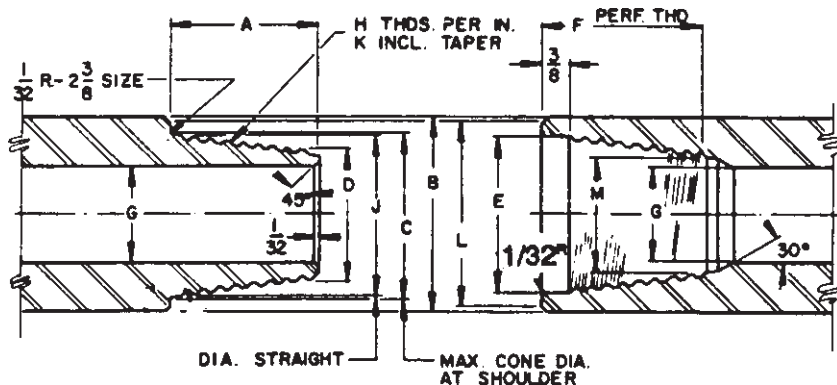
① Threaded portion same as 2 3/8" API-IF, NC26.

② Threaded portion same as 2 7/8" API-IF, NC31.

③ Threaded portion same as 3 1/2" Hughes Xtra Hole and 3 1/2" Reed  
Semi-Internal Flush.

④ Threaded portion same as 3 1/2" API-IF, NC38.

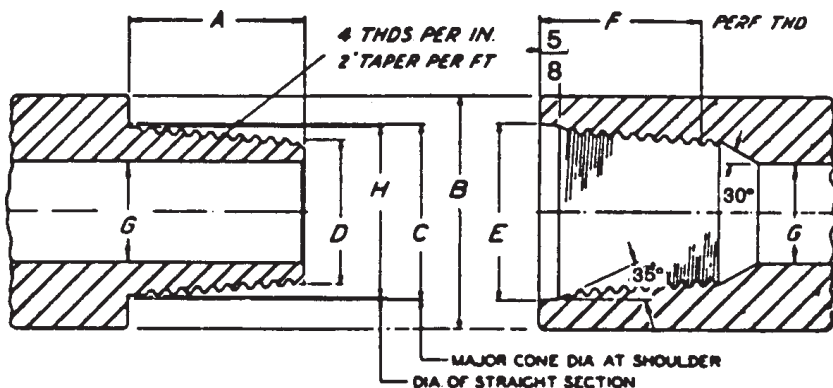
## HUGHES SLIM LINE H-90 HOLE (SH) DIMENSIONAL DATA



| Size  | A             | B                                                                                                    | C             | D             | E               | F              | G                                                                                                                                                                         | J               | L                                                                                             | M               | N               |
|-------|---------------|------------------------------------------------------------------------------------------------------|---------------|---------------|-----------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------|-----------------|-----------------|
|       | in            | in                                                                                                   | in            | in            | in              | in             | in                                                                                                                                                                        | in              | in                                                                                            | in              | in              |
|       | mm            | mm                                                                                                   | mm            | mm            | mm              | mm             | mm                                                                                                                                                                        | mm              | mm                                                                                            | mm              | mm              |
| 2 3/8 | 2 3/4<br>69.9 | 3 1/8<br>79.4<br>3 1/4<br>82.6                                                                       | 2.725<br>69.2 | 2.439<br>62.0 | 2 49/64<br>70.2 | 3 1/16<br>77.8 | 1 1/2<br>38.1                                                                                                                                                             | 2 43/64<br>67.9 | 3 1/16<br>77.8<br>3 3/16<br>81.0                                                              | 2 1/4<br>57.2   | 2 5/8<br>66.7   |
| 2 7/8 | 2 7/8<br>73.0 | 3 3/4<br>95.3<br>3 7/8<br>98.4<br>4<br>101.6<br>4 1/8<br>104.8<br>4 1/4<br>108.0                     | 3.196<br>81.2 | 2.897<br>73.6 | 3 15/64<br>82.2 | 3 3/8<br>85.7  | 2 1/8 - 2 1/4<br>54.0 - 57.1<br>2 1/8 - 2 1/4<br>54.0 - 57.1<br>2 1/8 - 2 1/4<br>54.0 - 57.1<br>2<br>50.8<br>1 3/4 - 2<br>44.5 - 50.8<br>1 1/2 - 1 3/4<br>38.1 - 44.5     | 3 5/32<br>80.2  | 3 13/16<br>92.1<br>3 23/32<br>94.5<br>3 13/16<br>96.8<br>3 29/32<br>99.2<br>4<br>101.6        | 2 45/64<br>68.7 | 3 3/32<br>78.6  |
| 3 1/2 | 3 1/8<br>79.4 | 4 5/8<br>117.5<br>4 3/4<br>120.7<br>4 7/8<br>123.8<br>4 7/8<br>123.8<br>5<br>127.0<br>5 1/8<br>130.2 | 3.835<br>97.4 | 3.509<br>89.1 | 3 7/8<br>98.4   | 3 3/8<br>85.7  | 2 3/8 - 2 3/4<br>60.3 - 69.9<br>2 1/2 - 2 3/4<br>63.5 - 69.9<br>2 5/8<br>66.7<br>2 3/8 - 2 1/2<br>60.3 - 63.5<br>2 - 2 3/8<br>50.8 - 60.3<br>1 3/4 - 2 1/8<br>44.5 - 54.0 | 3 25/32<br>96.0 | 4 7/16<br>112.7<br>4 17/32<br>115.1<br>4 5/8<br>117.5<br>4 23/32<br>119.9<br>4 13/16<br>122.2 | 3 11/32<br>84.9 | 3 47/64<br>94.9 |



## HUGHES EXTRA HOLE (XH) DIMENSIONAL DATA



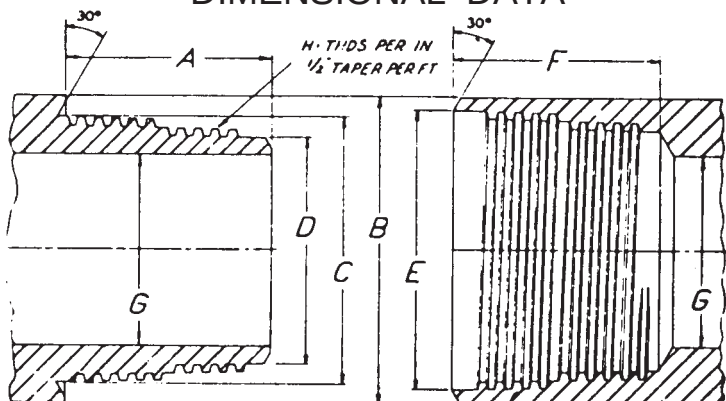
### HUGHES XTRA HOLE

| Size    | A              | B              | C                | D               | E                | F                | G              | H                |
|---------|----------------|----------------|------------------|-----------------|------------------|------------------|----------------|------------------|
|         | in             | in             | in               | in              | in               | in               | in             | in               |
|         | mm             | mm             | mm               | mm              | mm               | mm               | mm             | mm               |
| 2 7/8 ① | 3 7/8<br>98.4  | 4 1/4<br>108.0 | 3 21/64<br>84.5  | 2 11/16<br>68.3 | 3 23/64<br>85.3  | 4 1/2<br>114.3   | 1 7/8<br>47.6  | 3 7/32<br>81.8   |
| 3 1/2 ② | 3 3/8<br>85.7  | 4 3/4<br>120.7 | 3 13/16<br>96.8  | 3 1/4<br>82.6   | 3 7/8<br>98.4    | 3 15/16<br>100.0 | 2 7/16<br>61.9 | 3 45/64<br>94.1  |
| 4 1/2 ③ | 4 3/8<br>111.1 | 6 1/4<br>158.8 | 4 53/64<br>122.6 | 4 7/64<br>104.4 | 4 29/32<br>124.6 | 4 15/16<br>125.4 | 3 1/4<br>82.6  | 4 23/32<br>119.9 |
| 5 ④     | 4 1/2<br>114.3 | 6 3/8<br>161.9 | 5 1/4<br>133.4   | 4 1/2<br>114.3  | 5 5/16<br>134.9  | 4 7/8<br>123.8   | 3 3/4<br>95.3  | 5 9/64<br>130.6  |

- ① Threaded portion same as 3 1/2" Reed Double Streamline.
- ② Threaded portion same as 4 1/2" Hughes Ext. Flush and 4 1/2" F.H. Reed Ext. Flush.
- ③ Threaded portion same as 4" API-IF and 5" Reed Double Streamline.
- ④ Threaded portion same as 4 1/2" API-IF and 5 1/2" Reed Double Streamline.



## HYDRIL IF / F / EIU JOINTS DIMENSIONAL DATA



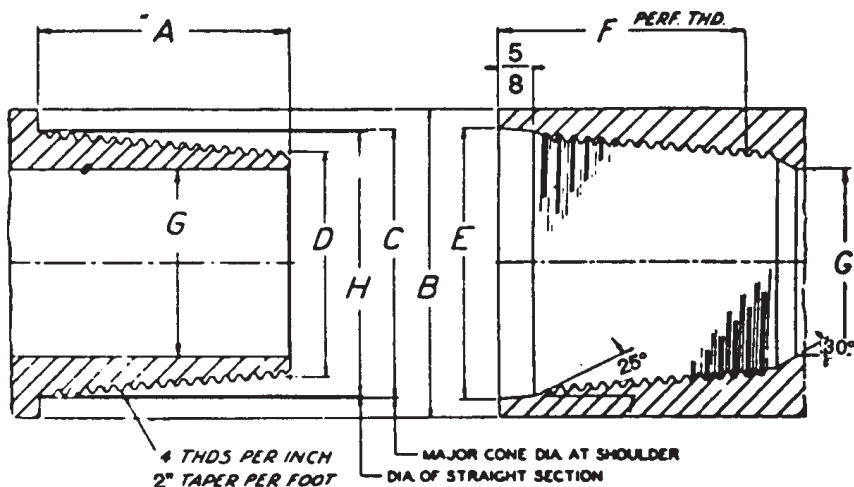
| Type | Size    | Weight         | A                | B               | C                | D                | E                | F                | G               | H          |
|------|---------|----------------|------------------|-----------------|------------------|------------------|------------------|------------------|-----------------|------------|
|      |         | lb/ft<br>Kg/m  | in<br>mm         | in<br>mm        | in<br>mm         | in<br>mm         | in<br>mm         | in<br>mm         | in<br>mm        | TPI        |
| IF   | 2 3/8   | 6.65<br>9.90   | 3 15/16<br>100.0 | 3 3/8<br>85.7   | 2 13/16<br>71.4  | 2 21/64<br>59.1  | 2 13/16<br>71.4  | 3 59/64<br>99.6  | 1 3/4<br>44.5   | 3<br>76.2  |
|      | 2 7/8   | 10.40<br>15.48 | 3 57/64<br>98.8  | 3 7/8<br>98.4   | 3 3/16<br>81.0   | 2 45/64<br>68.7  | 3 3/16<br>81.0   | 3 59/64<br>99.6  | 2 7/64<br>53.6  | 3<br>76.2  |
|      | 2 7/8   | 11.80<br>17.56 | 3 57/64<br>98.8  | 3 7/8<br>98.4   | 3 3/16<br>81.0   | 2 45/64<br>68.7  | 3 3/16<br>81.0   | 3 59/64<br>99.6  | 2<br>50.8       | 3<br>76.2  |
|      | 3 1/2   | 13.30<br>19.79 | 3 61/64<br>100.4 | 4 1/2<br>114.3  | 3 27/32<br>97.6  | 3 23/64<br>85.3  | 3 27/32<br>97.6  | 3 31/32<br>100.8 | 2 3/4<br>69.9   | 3<br>76.2  |
|      | 3 1/2   | 15.50<br>23.07 | 3 61/64<br>100.4 | 4 1/2<br>114.3  | 3 27/32<br>97.6  | 3 23/64<br>85.3  | 3 27/32<br>97.6  | 3 31/32<br>100.8 | 2 9/16<br>65.1  | 3<br>76.2  |
|      | 4 1/2   | 16.60<br>24.70 | 4<br>101.6       | 6<br>152.4      | 5 13/64<br>132.2 | 4 35/64<br>115.5 | 5 7/32<br>132.6  | 4 1/64<br>102.0  | 3 3/4<br>95.3   | 3<br>76.2  |
|      | 4 1/2   | 20.00<br>29.76 | 4<br>101.6       | 6<br>152.4      | 5 13/64<br>132.2 | 4 35/64<br>115.5 | 5 7/32<br>132.6  | 4 1/64<br>102.0  | 3 3/4<br>95.3   | 3<br>76.2  |
|      | 5 *     | 20.50<br>30.51 | 4 23/32<br>119.9 | 6 5/8<br>168.3  | 5 25/32<br>146.8 | 5 1/64<br>127.4  | 5 51/64<br>147.2 | 4 3/4<br>120.7   | 4 3/16<br>106.4 | 2<br>50.8  |
|      | 2 3/8   | 6.65<br>9.90   | 2 5/8<br>66.7    | 2 3/8<br>60.3   | 1 59/64<br>48.8  | 1 43/64<br>42.5  | 1 15/16<br>49.2  | 2 15/32<br>62.7  | 1<br>25.4       | 4<br>101.6 |
|      | 2 7/8   | 10.40<br>15.48 | 3 21/32<br>92.9  | 2 7/8<br>73.0   | 2 23/64<br>59.9  | 1 29/32<br>48.4  | 2 3/8<br>60.3    | 3 1/2<br>88.9    | 1 1/16<br>27.0  | 4<br>101.6 |
|      | 3 1/2   | 13.30<br>19.79 | 4 1/16<br>103.2  | 3 1/2<br>88.9   | 2 13/16<br>71.4  | 2 21/64<br>59.1  | 2 13/16<br>71.4  | 3 59/64<br>99.6  | 1 1/2<br>38.1   | 3<br>76.2  |
|      | 4       | 14.00<br>20.83 | 3 59/64<br>99.6  | 4 1/16<br>103.2 | 3 5/16<br>84.1   | 2 55/64<br>72.6  | 3 11/32<br>84.9  | 3 29/32<br>99.2  | 2<br>50.8       | 3<br>76.2  |
| F    | 4 1/2   | 16.60<br>24.70 | 3 61/64<br>100.4 | 4 1/2<br>114.3  | 3 27/32<br>97.6  | 3 23/64<br>85.3  | 3 27/32<br>97.6  | 3 31/32<br>100.8 | 2 3/16<br>55.6  | 3<br>76.2  |
|      | 5 *     | 19.50<br>29.02 | 4 5/16<br>109.5  | 5<br>127.0      | 4 3/16<br>106.4  | 3 35/64<br>90.1  | 4 13/64<br>106.8 | 4<br>101.6       | 2 5/16<br>58.7  | 3<br>76.2  |
|      | 5 1/2   | 21.90<br>32.59 | 4 1/4<br>108.0   | 5 9/16<br>141.3 | 4 21/32<br>118.3 | 4 1/64<br>102.0  | 4 43/64<br>118.7 | 4 1/32<br>102.4  | 2 3/4<br>69.9   | 3<br>76.2  |
|      | 6 5/8 * | 25.20<br>37.50 | 5 5/16<br>134.9  | 6 5/8<br>168.3  | 5 11/16<br>144.5 | 4 29/32<br>124.6 | 5 45/64<br>144.9 | 5 1/8<br>130.2   | 3 1/2<br>88.9   | 2<br>50.8  |
|      | 3 1/2   | 13.30<br>19.79 | 4 1/4<br>108.0   | 4 5/8<br>117.5  | 3 47/64<br>94.9  | 3 17/64<br>82.9  | 3 3/4<br>95.3    | 4<br>101.6       | 2 7/16<br>61.9  | 3<br>76.2  |
|      | 4       | 14.00<br>20.83 | 4 5/16<br>109.5  | 5 9/16<br>141.3 | 4 21/64<br>109.9 | 4 1/64<br>102.0  | 4 43/64<br>118.7 | 4 1/32<br>102.4  | 3 1/8<br>79.4   | 3<br>76.2  |
|      | 4 1/2   | 20.00<br>29.76 | 4 7/16<br>112.7  | 5 3/4<br>146.1  | 4 47/64<br>120.3 | 4 3/32<br>104.0  | 4 3/4<br>120.7   | 4 1/8<br>104.8   | 3 5/32<br>80.2  | 3<br>76.2  |
|      | 5 1/2   | 21.90<br>32.59 | 5 1/2<br>139.7   | 7<br>177.8      | 5 53/64<br>148.0 | 5 1/16<br>128.6  | 5 27/32<br>148.4 | 5 1/8<br>130.2   | 4<br>101.6      | 2<br>50.8  |
|      | 6 5/8 * | 25.20<br>37.50 | 5 1/2<br>139.7   | 8<br>203.2      | 6 7/8<br>174.6   | 6 7/64<br>155.2  | 6 57/64<br>175.0 | 5 1/8<br>130.2   | 5<br>127.0      | 2<br>50.8  |
|      | 3 1/2   | 13.30<br>19.79 | 4 1/4<br>108.0   | 4 5/8<br>117.5  | 3 47/64<br>94.9  | 3 17/64<br>82.9  | 3 3/4<br>95.3    | 4<br>101.6       | 2 7/16<br>61.9  | 3<br>76.2  |
| EIU  | 4       | 14.00<br>20.83 | 4 5/16<br>109.5  | 5 9/16<br>141.3 | 4 21/64<br>109.9 | 4 1/64<br>102.0  | 4 43/64<br>118.7 | 4 1/32<br>102.4  | 3 1/8<br>79.4   | 3<br>76.2  |
|      | 4 1/2   | 20.00<br>29.76 | 4 7/16<br>112.7  | 5 3/4<br>146.1  | 4 47/64<br>120.3 | 4 3/32<br>104.0  | 4 3/4<br>120.7   | 4 1/8<br>104.8   | 3 5/32<br>80.2  | 3<br>76.2  |
|      | 5 1/2   | 21.90<br>32.59 | 5 1/2<br>139.7   | 7<br>177.8      | 5 53/64<br>148.0 | 5 1/16<br>128.6  | 5 27/32<br>148.4 | 5 1/8<br>130.2   | 4<br>101.6      | 2<br>50.8  |
|      | 6 5/8 * | 25.20<br>37.50 | 5 1/2<br>139.7   | 8<br>203.2      | 6 7/8<br>174.6   | 6 7/64<br>155.2  | 6 57/64<br>175.0 | 5 1/8<br>130.2   | 5<br>127.0      | 2<br>50.8  |
|      | 3 1/2   | 13.30<br>19.79 | 4 1/4<br>108.0   | 4 5/8<br>117.5  | 3 47/64<br>94.9  | 3 17/64<br>82.9  | 3 3/4<br>95.3    | 4<br>101.6       | 2 7/16<br>61.9  | 3<br>76.2  |

\* Obsolete Hydril Connection.

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## REED DOUBLE STREAMLINE DIMENSIONAL DATA



### REED DOUBLE STREAMLINE

| Size    | A              | B                 | C                | D               | E                  | F              | G               | H               |
|---------|----------------|-------------------|------------------|-----------------|--------------------|----------------|-----------------|-----------------|
|         | in             | in                | in               | in              | in                 | in             | in              | in              |
|         | mm             | mm                | mm               | mm              | mm                 | mm             | mm              | mm              |
| 2 7/8   | 3 1/2<br>88.9  | 3 1/4<br>82.6     | 2 45/64<br>68.7  | 2 1/8<br>54.0   | 2 5/8 *<br>66.7    | 3 7/8<br>98.4  | 1 1/4<br>31.8   | 2 19/32<br>65.9 |
| 3 1/2 ① | 4<br>101.6     | 3 7/8<br>98.4     | 3 21/64<br>84.5  | 2 21/32<br>67.5 | 3 1/4 *<br>82.6    | 4 3/8<br>111.1 | 1 13/16<br>46.0 | 3 15/64<br>82.2 |
| 4       | 4<br>101.6     | 4 1/2<br>114.3    | 3 57/64<br>98.8  | 3 7/32<br>81.8  | 3 55/64 *<br>98.0  | 4 3/8<br>111.1 | 2 3/8<br>60.3   | 3 51/64<br>96.4 |
| 4 1/2   | 4 1/2<br>114.3 | 5<br>127.0        | 4 9/32<br>108.7  | 3 17/32<br>89.7 | 4 15/64 *<br>107.6 | 4 7/8<br>123.8 | 2 11/16<br>68.3 | 4 3/16<br>106.4 |
| 5 ②     | 4 1/2<br>114.3 | 5 9/16<br>141.3 * | 4 53/64<br>122.6 | 4 5/64<br>103.6 | 4 55/64<br>123.4   | 4 7/8<br>123.8 | 3 3/8<br>85.7   | 4 3/4<br>120.7  |
| 5 1/2 ③ | 4 1/2<br>114.3 | 6 1/8<br>155.6 *  | 5 1/4<br>133.4   | 4 1/2<br>114.3  | 5 5/16<br>134.9    | 4 7/8<br>123.8 | 3 3/4<br>95.3   | 5 3/16<br>131.8 |

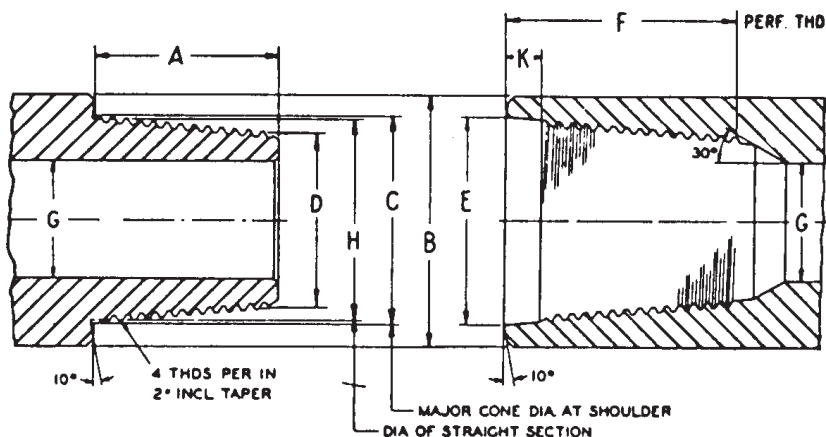
\* Straight Counterbore

① Threaded portions same as 2 7/8" Hughes Xtra Hole

② Threaded portions same as 4" API-IF and 4 1/2" Hughes Xtra Hole.

③ Threaded portions same as 4 1/2" API-IF.

## REED EXTERNAL FLUSH DIMENSIONAL DATA



### REED EXTERNAL FLUSH

| Size  | Type | A             | B                | C                 | D               | E                 | F              | G              | H               | K             |
|-------|------|---------------|------------------|-------------------|-----------------|-------------------|----------------|----------------|-----------------|---------------|
|       |      | in<br>mm      | in<br>mm         | in<br>mm          | in<br>mm        | in<br>mm          | in<br>mm       | in<br>mm       | in<br>mm        | in<br>mm      |
| 2 3/8 | Reg  | 2 5/8<br>66.7 | 2 3/8<br>60.3    | 2<br>50.8         | 1 9/16<br>39.7  | 1 15/16 *<br>49.2 | 3<br>76.2      | 7/8<br>22.2    | 1 15/16<br>49.2 | 1/2<br>13     |
| 2 3/8 | FH   | 2 5/8<br>66.7 | 2 1/2<br>63.5    | 2 1/8<br>54.0     | 1 11/16<br>42.9 | 2 1/16 *<br>52.4  | 3<br>76.2      | 1<br>25.4      | 2 1/64<br>51.2  | 1/2<br>12.7   |
| 2 7/8 | FH   | 3<br>76.2     | 3<br>76.2        | 2 13/32<br>61.1   | 1 29/32<br>48.4 | 2 3/8 *<br>60.3   | 3 3/8<br>85.7  | 1 1/4<br>31.8  | 2<br>58.7       | 1/2<br>12.7   |
| 3 1/2 | FH①  | 3 1/4<br>82.6 | 3 5/8<br>92.1    | 3<br>76.2         | 2 29/64<br>62.3 | 3 1/32<br>77.0    | 4<br>101.6     | 1 1/2<br>38.1  | -               | 21/32<br>16.7 |
| 4 1/2 | FH②  | 3 3/8<br>85.7 | 4 11/16<br>119.1 | 3 13/16 *<br>96.8 | 3 1/4<br>82.6   | 3 7/8<br>98.4     | 4 1/4<br>108.0 | 2 3/16<br>55.6 | -               | 21/32<br>16.7 |

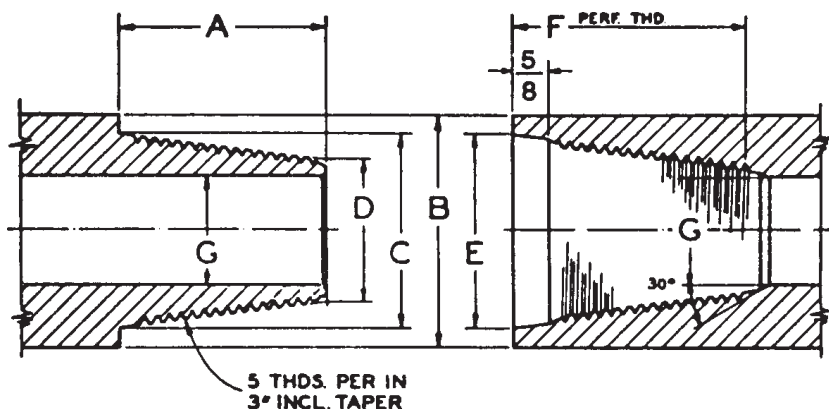
\* Straight Counterbore

① Threaded portion same as 3/12" Hughes External Flush.

② Threaded portion same as 4 1/2" Hughes External Flush, 3 1/2" Hughes Xtra Hole, 4" Hughes Slim Hole and 3 1/2" Reed Extra Hole.



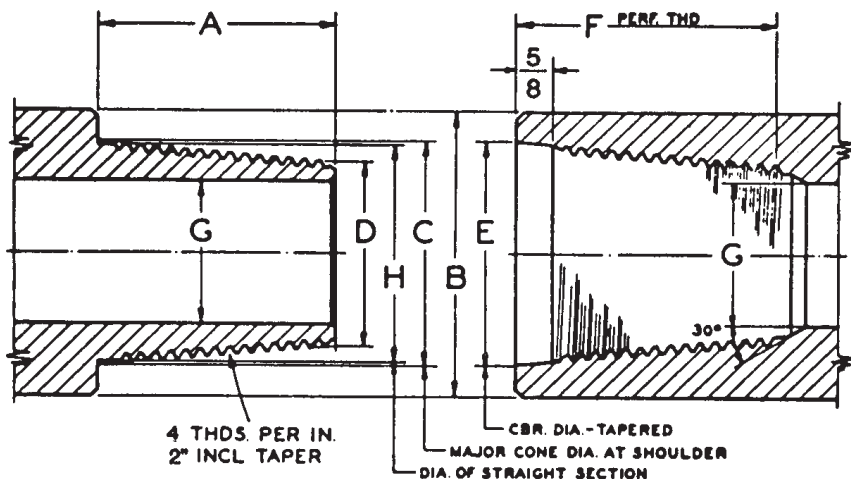
## REED FULL HOLE DIMENSIONAL DATA



## REED FULL HOLE

| Size  | A     | B     | C       | D       | E       | F     | G      |
|-------|-------|-------|---------|---------|---------|-------|--------|
|       | in    | in    | in      | in      | in      | in    | in     |
|       | mm    | mm    | mm      | mm      | mm      | mm    | mm     |
| 2 3/8 | 3     | 3 3/8 | 2 25/32 | 2 1/32  | 2 27/32 | 3 3/8 | 1 7/16 |
|       | 76.2  | 85.7  | 70.6    | 51.6    | 72.2    | 85.7  | 36.5   |
| 2 7/8 | 3 1/2 | 4     | 3 11/32 | 2 15/32 | 3 13/32 | 3 7/8 | 1 7/8  |
|       | 88.9  | 101.6 | 84.9    | 62.7    | 86.5    | 98.4  | 47.6   |

## REED SEMI-INTERNAL FLUSH DIMENSIONAL DATA



## REED SEMI-INTERNAL FLUSH

| Size    | A              | B              | C                | D               | E                | F              | G              | H                |
|---------|----------------|----------------|------------------|-----------------|------------------|----------------|----------------|------------------|
|         | in<br>mm       | in<br>mm       | in<br>mm         | in<br>mm        | in<br>mm         | in<br>mm       | in<br>mm       | in<br>mm         |
| 3 1/2 ① | 3 1/2<br>88.9  | 4 7/8<br>123.8 | 3 13/16<br>96.8  | 3 9/64<br>79.8  | 3 7/8<br>98.4    | 4 3/8<br>111.1 | 2 7/16<br>61.9 | 3 45/64<br>94.1  |
| 4 1/2 ② | 4 1/2<br>114.3 | 6<br>152.4     | 4 53/64<br>122.6 | 4 5/64<br>103.6 | 4 57/64<br>124.2 | 4 7/8<br>123.8 | 3 5/16<br>84.1 | 4 23/32<br>119.9 |
| 5 ③     | 4 1/2<br>114.3 | 6 1/8<br>155.6 | 5 1/4<br>133.4   | 4 1/2<br>114.3  | 5 5/16<br>134.9  | 4 7/8<br>123.8 | 3 3/4<br>95.3  | 5 9/64<br>130.6  |

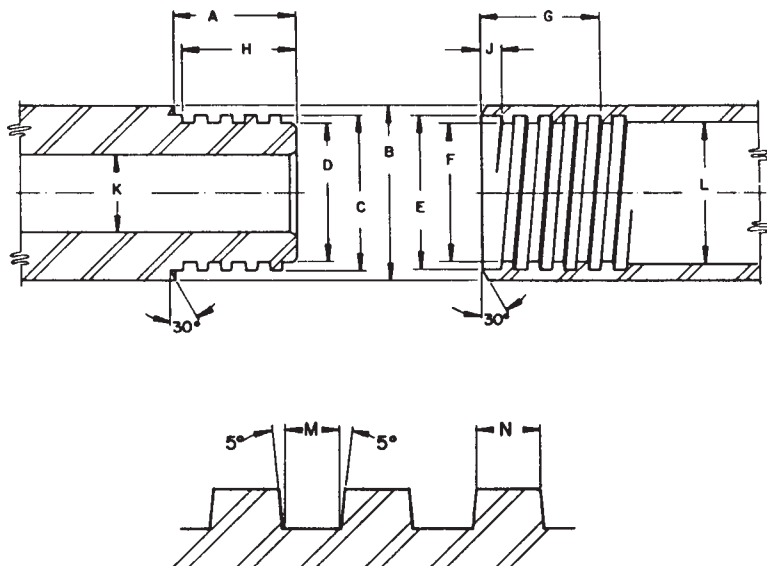
① Threaded portions same as 3 1/2" Hughes Xtra Hole and 4" Hughes Slim Hole.

② Threaded portion same as 4" API-IF and 4 1/2" Hughes Xtra Hole and 5" Reed Double Streamline.

③ Threaded portion same as 4 1/2" API-IF and 5" Hughes Xtra Hole and 5 1/2" Reed Double Streamline.



## "X" SERIES DRILL ROD DIMENSIONAL DATA

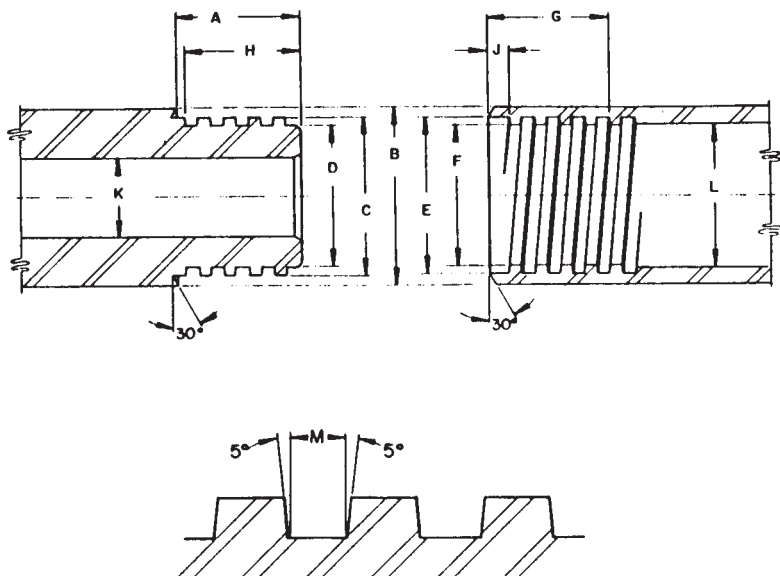


| Symbol     | A             | B              | C              |                | D              |                | E              |                | F              |                | G              |
|------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|            |               |                | Max.           | Min.           | Max.           | Min.           | Max.           | Min.           | Max.           | Min.           |                |
|            | in<br>mm      | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       |                |
| E ROD (3") | 1.50<br>38.10 | 1.312<br>33.32 | 0.999<br>25.37 | 0.997<br>25.32 | 0.874<br>22.20 | 0.870<br>22.10 | 1.003<br>25.48 | 1.001<br>25.43 | 0.878<br>22.30 | 0.876<br>22.25 | 1.625<br>41.28 |
| A ROD (3") | 1.75<br>44.45 | 1.625<br>41.28 | 1.264<br>32.11 | 1.262<br>32.05 | 1.139<br>28.93 | 1.134<br>28.80 | 1.268<br>32.21 | 1.266<br>32.16 | 1.143<br>29.03 | 1.141<br>28.98 | 1.875<br>47.63 |
| B ROD (5") | 1.87<br>47.50 | 1.906<br>48.41 | 1.405<br>35.69 | 1.403<br>35.64 | 1.280<br>32.51 | 1.275<br>32.39 | 1.409<br>35.79 | 1.407<br>35.74 | 1.284<br>32.61 | 1.282<br>32.56 | 2.000<br>50.80 |
| N ROD (4") | 2.37<br>60.20 | 2.375<br>60.33 | 1.874<br>47.60 | 1.872<br>47.55 | 1.686<br>42.82 | 1.681<br>42.70 | 1.878<br>47.70 | 1.876<br>47.65 | 1.690<br>42.93 | 1.688<br>42.88 | 2.500<br>63.50 |
| N ROD (3") | 2.37<br>60.20 | 2.375<br>60.33 | 1.874<br>47.60 | 1.872<br>47.55 | 1.686<br>42.82 | 1.681<br>42.70 | 1.878<br>47.70 | 1.876<br>47.65 | 1.690<br>42.93 | 1.688<br>42.88 | 2.500<br>63.50 |

| Symbol     | H              | J            | K              | L              | M (Box)        |                | M (Pin)        |                | N (Box)        |                | N (Pin)        |                |
|------------|----------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|            |                |              |                |                | Max.           | Min.           | Max.           | Min.           | Max.           | Min.           | Max.           | Min.           |
|            | in<br>mm       | in<br>mm     | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       | in<br>mm       |
| E ROD (3") | 1.437<br>36.50 | 0.25<br>6.35 | 0.437<br>11.10 | 0.843<br>21.41 | 0.1680<br>4.27 | 0.1617<br>4.11 | 0.1657<br>4.21 | 0.1617<br>4.11 | 0.1608<br>4.08 | 0.1544<br>3.92 | 0.1608<br>4.08 | 0.1563<br>3.97 |
| A ROD (3") | 1.687<br>42.85 | 0.25<br>6.35 | 0.562<br>14.27 | 1.265<br>32.13 | 0.1680<br>4.27 | 0.1617<br>4.11 | 0.1657<br>4.21 | 0.1617<br>4.11 | 0.1608<br>4.08 | 0.1544<br>3.92 | 0.1608<br>4.08 | 0.1563<br>3.97 |
| B ROD (5") | 1.812<br>46.02 | 0.25<br>6.35 | 0.625<br>15.88 | 1.406<br>35.71 | 0.1014<br>2.58 | 0.0950<br>2.41 | 0.0990<br>2.51 | 0.0950<br>2.41 | 0.0941<br>2.39 | 0.0877<br>2.23 | 0.0941<br>2.39 | 0.0897<br>2.28 |
| N ROD (4") | 2.312<br>58.72 | 0.31<br>7.87 | 1.000<br>25.40 | 2.000<br>50.80 | 0.1236<br>3.14 | 0.1173<br>2.98 | 0.1212<br>3.08 | 0.1173<br>2.98 | 0.1163<br>2.95 | 0.1099<br>2.79 | 0.1164<br>2.96 | 0.1120<br>2.84 |
| N ROD (3") | 2.312<br>58.72 | 0.31<br>7.87 | 1.000<br>25.40 | 2.000<br>50.80 | 0.1653<br>4.20 | 0.1590<br>4.04 | 0.1653<br>4.20 | 0.1590<br>4.04 | 0.1581<br>4.02 | 0.1517<br>3.85 | 0.1581<br>4.02 | 0.1517<br>3.85 |

\* Threads per inch.

## "W" SERIES DRILL ROD DIMENSIONAL DATA



| Symbol      | A            | B            | C            |              | D            |              | E            |              | F            |              |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|             |              |              | Max.         | Min.         | Max.         | Min.         | Max.         | Min.         | Max.         | Min.         |
|             | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     | in<br>mm     |
| EW ROD (3") | 1.56         | 1.375        | 1.062        | 1.060        | 0.937        | 0.932        | 1.066        | 1.064        | 0.941        | 0.939        |
|             | <b>39.67</b> | <b>34.93</b> | <b>26.97</b> | <b>26.92</b> | <b>23.80</b> | <b>23.67</b> | <b>27.08</b> | <b>27.03</b> | <b>23.90</b> | <b>23.85</b> |
| AW ROD (3") | 1.88         | 1.750        | 1.374        | 1.372        | 1.249        | 1.244        | 1.378        | 1.376        | 1.253        | 1.251        |
|             | <b>47.63</b> | <b>44.45</b> | <b>34.90</b> | <b>34.85</b> | <b>31.72</b> | <b>31.60</b> | <b>35.00</b> | <b>34.95</b> | <b>31.83</b> | <b>31.78</b> |
| BW ROD (3") | 2.25         | 2.125        | 1.684        | 1.682        | 1.527        | 1.522        | 1.688        | 1.686        | 1.531        | 1.529        |
|             | <b>57.15</b> | <b>53.98</b> | <b>42.77</b> | <b>42.72</b> | <b>38.79</b> | <b>38.66</b> | <b>42.88</b> | <b>42.82</b> | <b>38.89</b> | <b>38.84</b> |
| NW ROD (3") | 2.75         | 2.625        | 2.218        | 2.216        | 2.030        | 2.025        | 2.222        | 2.220        | 2.034        | 2.032        |
|             | <b>69.85</b> | <b>66.68</b> | <b>56.34</b> | <b>56.29</b> | <b>51.56</b> | <b>51.44</b> | <b>56.44</b> | <b>56.39</b> | <b>51.66</b> | <b>51.61</b> |

| Symbol      | G            | H            | J           | K            | L            | M (Box)     |             | M (Pin)     |             |
|-------------|--------------|--------------|-------------|--------------|--------------|-------------|-------------|-------------|-------------|
|             |              |              |             |              |              | Max.        | Min.        | Max.        | Min.        |
|             | in<br>mm     | in<br>mm     | in<br>mm    | in<br>mm     | in<br>mm     | in<br>mm    | in<br>mm    | in<br>mm    | in<br>mm    |
| EW ROD (3") | 1.562        | 1.437        | 0.312       | 0.437        | 1.062        | 0.1680      | 0.1617      | 0.1657      | 0.1617      |
|             | <b>39.67</b> | <b>36.50</b> | <b>7.92</b> | <b>11.10</b> | <b>26.97</b> | <b>4.27</b> | <b>4.11</b> | <b>4.21</b> | <b>4.11</b> |
| AW ROD (3") | 1.875        | 1.750        | 0.375       | 0.625        | 1.437        | 0.1680      | 0.1617      | 0.1657      | 0.1617      |
|             | <b>47.63</b> | <b>44.45</b> | <b>9.53</b> | <b>15.88</b> | <b>36.50</b> | <b>4.27</b> | <b>4.11</b> | <b>4.21</b> | <b>4.11</b> |
| BW ROD (3") | 2.250        | 2.125        | 0.375       | 0.750        | 1.812        | 0.1665      | 0.1604      | 0.1641      | 0.1604      |
|             | <b>57.15</b> | <b>53.98</b> | <b>9.53</b> | <b>19.05</b> | <b>46.02</b> | <b>4.23</b> | <b>4.07</b> | <b>4.17</b> | <b>4.07</b> |
| NW ROD (3") | 2.750        | 2.625        | 0.375       | 1.375        | 2.312        | 0.1651      | 0.1590      | 0.1627      | 0.1590      |
|             | <b>69.85</b> | <b>66.68</b> | <b>9.53</b> | <b>34.93</b> | <b>58.72</b> | <b>4.19</b> | <b>4.04</b> | <b>4.13</b> | <b>4.04</b> |

\* Threads per inch.

# **Longyear DIAMOND CORE DRILLING DIMENSIONS, WEIGHTS and VOLUMES**

## **DRILL RODS AND CASING DRILL RODS**

| SIZE | O.D.<br>(inches) | I.D.<br>(inches) | WT.<br>(lbs. per<br>10 ft.) | COUPLING<br>I.D. (in.) | THREADS<br>per inch | CONTENT<br>(gal. per<br>100 feet) |
|------|------------------|------------------|-----------------------------|------------------------|---------------------|-----------------------------------|
| E*   | 1-5/16           | 27-32            | 38                          | 7/16                   | 3                   | 2.9                               |
| A*   | 1-5/8            | 1-1/8            | 38                          | 9/16                   | 5                   | 5.2                               |
| B    | 1-29/32          | 1-13/32          | 46                          | 5/8                    | 5                   | 8.1                               |
| N    | 2-3/8            | 2                | 49                          | 1                      | 4                   | 16.3                              |
| RW*  | 1-3/32           | 23/32            | 19                          | 13/32                  | 4                   | 2.1                               |
| AW*  | 1-3/8            | 7/8              | 31                          | 1/2                    | 3                   | 3.1                               |
| BW   | 1-23/32          | 1-7/32           | 41                          | 5/8                    | 3                   | 6.1                               |
| NW   | 2-1/4            | 1-3/4            | 42                          | 3/4                    | 3                   | 12.5                              |
| HW   | 2-5/8            | 2-1/4            | 54                          | 1-3/8                  | 3                   | 20.7                              |
|      | 3-1/2            | 3-1/16           | 85                          | 2-3/8                  | 3                   | 38.3                              |

\* Parallel Wall

## **FLUSH-COUPLED CASING**

| SIZE | O.D.<br>(inches) | I.D.<br>(inches) | WT.<br>(lbs. per<br>10 ft.) | COUPLING<br>I.D. (in.) | THREADS<br>per inch | CONTENT<br>(gal. per<br>100 feet) |
|------|------------------|------------------|-----------------------------|------------------------|---------------------|-----------------------------------|
| RX** | 1-7/16           | 1-3/16           | 18                          | 1-3/16                 | 8                   | 5.7                               |
| EX   | 1-13/16          | 1-5/8            | 18                          | 1-1/2                  | 8                   | 10.8                              |
| AX   | 2-1/4            | 2                | 29                          | 1-29/32                | 8                   | 16.3                              |
| BX   | 2-7/8            | 2-9/16           | 47                          | 2-3/8                  | 8                   | 26.7                              |
| NX   | 3-1/2            | 3-3/16           | 60                          | 3                      | 8                   | 41.4                              |
| HX   | 4-1/2            | 4-1/8            | 90                          | 3-15/16                | 5                   | 69.4                              |

\*\* Formerly XRT

## **FLUSH-JOINT CASING**

| SIZE | O.D.<br>(inches) | I.D.<br>(inches) | WEIGHT<br>(lbs. per 10 ft.) | THREADS<br>per inch | CONTENT (gal.<br>per 100 feet) |
|------|------------------|------------------|-----------------------------|---------------------|--------------------------------|
| RW   | 1-7/16           | 1-3/16           | 18                          | 5                   | 5.7                            |
| EW   | 1-13/16          | 1-1/2            | 28                          | 4                   | 9.2                            |
| AW   | 2-1/4            | 1-29/32          | 38                          | 4                   | 14.8                           |
| BW   | 2-7/8            | 2-3/8            | 70                          | 4                   | 23.0                           |
| NW   | 3-1/2            | 3                | 86                          | 4                   | 36.7                           |
| HW   | 4-1/2            | 4                | 113                         | 4                   | 65.2                           |

All dimensions, weights and volumes shown are nominal approximations in inches, pounds and U.S. gallons.

## **WIRE LINE DRILL RODS SERIES "Q" WIRE LINE "WEDG-LOK" DRILL RODS**

| SIZE | O.D.<br>(inches) | I.D.<br>(inches) | WEIGHT<br>(lbs. per 10 ft.) | THREADS<br>per inch | CONTENT (gal.<br>per 100 feet) |
|------|------------------|------------------|-----------------------------|---------------------|--------------------------------|
| AQ   | 1-3/4            | 1-3/8            | 31                          | 4                   | 7.7                            |
| BQ   | 2-3/16           | 1-13/16          | 40                          | 3                   | 13.4                           |
| NQ   | 2-3/4            | 2-3/8            | 51                          | 3                   | 23.0                           |
| HQ   | 3-1/2            | 3-1/16           | 77                          | 3                   | 38.2                           |
| PQ   | 4-5/8 *          | 4-1/16           | 103 **                      | 3                   | 67.4                           |

\* Coupling O.D.

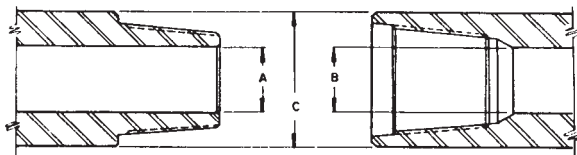
\* With Coupling

## **SERIES "CQ" COMPOSITE WIRE LINE DRILL RODS**

| SIZE | O.D.<br>(inches) | ROD<br>BODY I.D.<br>(inches) | TOOL<br>JOINT I.D.<br>(inches) | WEIGHT<br>(lbs. per<br>10 feet) | THREADS<br>per inch | CONTENT<br>(gal. per<br>100 feet) |
|------|------------------|------------------------------|--------------------------------|---------------------------------|---------------------|-----------------------------------|
| BCQ  | 2-3/16           | 1-7/8                        | 1-13/16                        | 34.5                            | 3                   | 14.2                              |
| NCQ  | 2-3/4            | 2-7/16                       | 2-3/8                          | 44.0                            | 3                   | 24.1                              |
| HCQ  | 3-1/2            | 3-3/16                       | 3-1/16                         | 57.3                            | 3                   | 41.1                              |
| PCQ  | 4-5/8            | 4-1/4                        | 4                              | 102.8                           | 3                   | 71.6                              |



## TOOL JOINTS RECOMMENDED MAXIMUM / MINIMUM DIMENSIONS



| Size  | Joints Type         | Nom O.D. | Nom I.D. | "A" Max. | "B" Max. | "C"     |        |
|-------|---------------------|----------|----------|----------|----------|---------|--------|
|       |                     |          |          |          |          | Min.    | Max.   |
| 2-3/8 | A.P.I. Reg.         | 3-1/8    | 1        | 1-1/8    | 1-5/8    | 2-15/16 | 3-1/4  |
|       | A.P.I. I.F.         | 3-3/8    | 1-3/4    | 1-3/4    | 2        | 3-3/16  | 3-5/8  |
|       | Acme Reg.           | 3-1/8    | 1        | 1-1/8    | 1-3/8    | 2-15/16 | 3-1/4  |
|       | Hydril I.F.         | 3-3/8    | 1-3/4    | 1-3/4    | 1-7/8    | 3-1/8   | 3-5/8  |
| 2-7/8 | A.P.I. Reg.         | 3-3/4    | 1-1/4    | 1-3/8    | 1-7/8    | 3-1/2   | 4      |
|       | A.P.I. F.H.         | 4-1/4    | 2-1/8    | 2-1/8    | 2-3/8    | 4-1/16  | 4-5/8  |
|       | A.P.I. I.F.         | 4-1/8    | 2-1/8    | 2-1/8    | 2-1/2    | 3-7/8   | 4-3/8  |
|       | Acme Reg.           | 3-3/4    | 1-1/4    | 1-5/16   | 1-5/8    | 3-1/2   | 4-1/8  |
|       | Hydril I.F.         | 3-7/8    | 2-1/8    | 2-3/16   | 2-3/16   | 3-5/8   | 4-1/8  |
|       | Hughes Xtra Hole    | 4-1/4    | 1-7/8    | 2-1/8    | 2-1/8    | 4       | 4-3/8  |
|       | Reed Db'l Str'mline | 3-1/4    | 1-1/4    | 1-1/4    | 1-3/4    | 3       | 3-1/2  |
| 3     | Union Tool          | 4-1/4    | 1-1/2    | 1-1/2    | 2-1/8    | 3-3/4   | 4-1/2  |
|       | A.P.I. Reg.         | 4-1/4    | 1-1/2    | 1-3/4    | 2-1/4    | 4       | 4-5/8  |
| 3-1/2 | A.P.I. F.H.         | 4-5/8    | 2-7/16   | 2-7/16   | 2-3/4    | 4-1/2   | 5      |
|       | A.P.I. I.F.         | 4-3/4    | 2-11/16  | 2-11/16  | 3        | 4-1/2   | 5      |
|       | Acme Reg.           | 4-1/4    | 1-3/4    | 1-7/8    | 2-1/4    | 4       | 4-5/8  |
|       | Acme Streamline     | 4-5/8    | 2-7/16   | 2-7/16   | 2-3/4    | 4-1/2   | 5      |
|       | Hydril I.F.         | 4-1/2    | 2-3/4    | 2-3/4    | 2-13/16  | 4-3/8   | 4-7/8  |
|       | Hughes Xtra Hole    | 4-3/4    | 2-7/16   | 2-7/16   | 2-3/4    | 4-1/2   | 5      |
|       | Reed Ext. FI - FH   | 3-5/8    | 1-1/2    | 1-1/2    | 1-3/4    | 3-1/2   | 4-1/8  |
|       | Reed Db'l Str'mline | 3-7/8    | 1-13/16  | 1-13/16  | 2-1/8    | 3-3/4   | 4-1/4  |
|       | A.P.I. F.H.         | 5-1/4    | 2-13/16  | 2-13/16  | 3-1/4    | 5       | 5-3/8  |
|       | A.P.I. I.F.         | 5-3/4    | 3-5/32   | 3-3/32   | 3-1/2    | 5-1/2   | 6      |
| 4     | Reed Db'l Str'mline | 4-1/2    | 2-3/8    | 2-3/8    | 2-5/8    | 4-1/4   | 4-3/4  |
|       | Union Tool          | 5-3/4    | 2-1/4    | 2-7/8    | 3-1/2    | 5-3/8   | 6      |
|       | A.P.I. Reg.         | 5-3/4    | 2-1/4    | 2-5/8    | 3-1/4    | 5-3/8   | 6      |
| 4-1/2 | A.P.I. F.H.         | 5-3/4    | 3        | 3-5/32   | 3-1/2    | 5-1/2   | 6      |
|       | A.P.I. I.F.         | 6-1/8    | 3-3/4    | 3-3/4    | 4-1/8    | 5-7/8   | 6-1/2  |
|       | Acme Reg.           | 5-1/2    | 2-1/2    | 2-11/16  | 3-1/8    | 5-3/8   | 6      |
|       | Acme Streamline     | 5-3/4    | 3        | 3        | 3-3/8    | 5-1/2   | 6-1/8  |
|       | Hydril I.F.         | 6        | 3-3/4    | 3-7/8    | 4        | 5-13/16 | 6-1/4  |
|       | Hughes Xtra Hole    | 6        | 3-1/4    | 3-1/4    | 3-3/8    | 5-5/8   | 6-1/4  |
|       | Reed Db'l Str'mline | 5        | 2-11/16  | 2-11/16  | 3        | 4-3/4   | 5-1/2  |
|       | Reed Db'l Str'mline | 5-5/8    | 3-3/8    | 3-3/8    | 3-3/4    | 5-1/2   | 6      |
| 5     | Hydril I.F.         | 6-5/8    | 4-3/16   | 4-1/4    | 4-3/8    | 6-1/2   | 7      |
|       | A.P.I. Reg. or U.T. | 6-3/4    | 2-3/4    | 3-1/4    | 3-7/8    | 6-3/8   | 7      |
|       | A.P.I. F.H.         | 7        | 4        | 4        | 4-1/2    | 6-1/2   | 7-1/4  |
|       | A.P.I. I.F.         | 7-3/8    | 4-13/16  | 4-13/16  | 5-1/4    | 7-1/8   | 7-7/8  |
|       | Acme Reg.           | 6-3/4    | 3        | 3-1/4    | 4        | 6-3/8   | 7      |
|       | Acme Streamline     | 7        | 4        | 4        | 4-3/8    | 6-11/16 | 7-1/4  |
|       | Reed Db'l Str'mline | 6-1/8    | 3-3/4    | 3-3/4    | 4        | 5-7/8   | 6-3/4  |
|       | A.P.I. Reg. or U.T. | 7-3/4    | 3-1/2    | 4        | 4-3/4    | 7-1/8   | 7-7/8  |
|       | A.P.I. F.H.         | 8        | 5        | 5        | 5-1/2    | 7-1/2   | 8-1/4  |
|       | A.P.I. I.F.         | 8-1/2    | 5-29/32  | 5-29/32  | 6-1/4    | 8-3/8   | 9      |
| 7-5/8 | Acme Reg.           | 7-3/4    | 3-1/2    | 3-7/8    | 4-5/8    | 7-3/8   | 8      |
|       | A.P.I. Reg.         | 8-7/8    | 4        | 4-1/4    | 5-1/4    | 8-1/8   | 9      |
| 8-5/8 | A.P.I. Reg.         | 10       | 4-3/4    | 5-1/4    | 6-1/4    | 9       | 10-1/8 |

All sizes in inches.



## TOOL JOINT MECHANICAL PROPERTIES

| Thread Type            | O.D.                   | I.D.                  | Tension<br>Yield<br>Strength | Torsion<br>Yield<br>Strength | Recomm.<br>Make-Up<br>Torque |
|------------------------|------------------------|-----------------------|------------------------------|------------------------------|------------------------------|
|                        | in<br>mm               | in<br>mm              | lbs<br>daN                   | ft.lbs<br>N.m                | ft.lbs<br>N.m                |
| 1 AM M.T.              | 1 9/16<br><b>39.7</b>  | 3/4<br><b>19.1</b>    | 51,300<br><b>22,800</b>      | 560<br><b>750</b>            | 320<br><b>430</b>            |
|                        | 1 9/16<br><b>39.7</b>  | 13/16<br><b>20.6</b>  | 42,800<br><b>19,000</b>      | 470<br><b>630</b>            | 260<br><b>350</b>            |
| 1 1/4 AM M.T.          | 1 3/4<br><b>44.5</b>   | 1<br><b>25.4</b>      | 51,500<br><b>22,900</b>      | 630<br><b>850</b>            | 350<br><b>470</b>            |
|                        | 1 3/4<br><b>44.5</b>   | 7/8<br><b>22.2</b>    | 71,700<br><b>31,800</b>      | 880<br><b>1,190</b>          | 500<br><b>670</b>            |
|                        | 1 3/4<br><b>44.5</b>   | 13/16<br><b>20.6</b>  | 80,800<br><b>35,900</b>      | 1,000<br><b>1,350</b>        | 570<br><b>770</b>            |
|                        | 1 3/4<br><b>44.5</b>   | 3/4<br><b>19.1</b>    | 89,300<br><b>39,700</b>      | 1,070<br><b>1,450</b>        | 610<br><b>820</b>            |
| 1 1/2 AM M.T.          | 2<br><b>50.8</b>       | 1<br><b>25.4</b>      | 98,300<br><b>43,700</b>      | 1,360<br><b>1,840</b>        | 770<br><b>1,040</b>          |
|                        | 2<br><b>50.8</b>       | 1 5/32<br><b>29.4</b> | 69,200<br><b>30,700</b>      | 950<br><b>1,280</b>          | 540<br><b>730</b>            |
|                        | 2<br><b>50.8</b>       | 1 1/8<br><b>28.6</b>  | 75,400<br><b>33,500</b>      | 1,030<br><b>1,390</b>        | 590<br><b>790</b>            |
|                        | 2<br><b>50.8</b>       | 1 1/16<br><b>27.0</b> | 87,200<br><b>38,700</b>      | 1,200<br><b>1,620</b>        | 680<br><b>920</b>            |
| 1 AM M.T. - DSI        | 1 9/16<br><b>39.7</b>  | 3/4<br><b>19.1</b>    | 54,400<br><b>24,100</b>      | 1,120<br><b>1,510</b>        | 360<br><b>480</b>            |
| 1 1/4 AM M.T. - DSI    | 1 3/4<br><b>44.5</b>   | 7/8<br><b>22.2</b>    | 75,300<br><b>33,400</b>      | 1,340<br><b>1,810</b>        | 560<br><b>750</b>            |
| 1 1/2 AM M.T. - DSI    | 2<br><b>50.8</b>       | 1<br><b>25.4</b>      | 105,800<br><b>47,000</b>     | 2,180<br><b>2,950</b>        | 850<br><b>1,150</b>          |
| 2 1/16 AM M.T. - DSI   | 2.330<br><b>59.2</b>   | 1 1/4<br><b>31.8</b>  | 112,700<br><b>50,100</b>     | 3,420<br><b>4,630</b>        | 1,000<br><b>1,350</b>        |
| 1 13/16 Homco F.J.     | 1 13/16<br><b>46.0</b> | 3/4<br><b>19.1</b>    | 100,700<br><b>44,700</b>     | 1,210<br><b>1,640</b>        | 690<br><b>930</b>            |
| 2 3/8 Homco F.J.       | 2 1/2<br><b>63.5</b>   | 1<br><b>25.4</b>      | 192,000<br><b>85,400</b>     | 3,190<br><b>4,320</b>        | 1,810<br><b>2,450</b>        |
| 1 13/16 Wilson F.J.    | 1 13/16<br><b>46.0</b> | 3/4<br><b>19.1</b>    | 116,900<br><b>51,900</b>     | 1,220<br><b>1,650</b>        | 690<br><b>930</b>            |
| 2 3/8 Wilson F.J.      | 2 1/2<br><b>63.5</b>   | 1 1/16<br><b>27.0</b> | 173,100<br><b>76,900</b>     | 2,810<br><b>3,800</b>        | 1,600<br><b>2,160</b>        |
| 2 L.D.C. (Argus A9SG)  | 2.0<br><b>50.8</b>     | 1.0<br><b>25.4</b>    | 114,900<br><b>51,100</b>     | 1,300<br><b>1,760</b>        | 700<br><b>940</b>            |
| 1 9/16 Homco Slimline  | 1 9/16<br><b>39.7</b>  | 15/16<br><b>23.8</b>  | 63,000<br><b>28,000</b>      | 700<br><b>940</b>            | 400<br><b>540</b>            |
| 1 13/16 Homco Slimline | 1 13/16<br><b>46.0</b> | 1<br><b>25.4</b>      | 89,800<br><b>39,900</b>      | 1,140<br><b>1,540</b>        | 650<br><b>880</b>            |
| 2 3/8 AM PAC           | 2 7/8<br><b>73.0</b>   | 1 3/8<br><b>34.9</b>  | 212,900<br><b>94,700</b>     | 4,280<br><b>5,800</b>        | 3,400<br><b>4,600</b>        |

## TOOL JOINT MECHANICAL PROPERTIES

| Thread Type        | O.D.                  | I.D.                   | Tension<br>Yield<br>Strength | Torsion<br>Yield<br>Strength | Recomm.<br>Make-Up<br>Torque |
|--------------------|-----------------------|------------------------|------------------------------|------------------------------|------------------------------|
|                    | in<br>mm              | in<br>mm               | lbs<br>daN                   | ft.lbs<br>N.m                | ft.lbs<br>N.m                |
| 2 7/8 AM PAC       | 3 1/8<br><b>79.4</b>  | 1 1/4<br><b>31.8</b>   | 303,500<br><b>135,000</b>    | 6,240<br><b>8,460</b>        | 4,960<br><b>6,720</b>        |
|                    | 3 1/8<br><b>79.4</b>  | 1 1/2<br><b>38.1</b>   | 244,100<br><b>108,500</b>    | 5,210<br><b>7,060</b>        | 4,150<br><b>5,620</b>        |
| 3 1/2 AM PAC       | 3 3/4<br><b>95.3</b>  | 2<br><b>50.8</b>       | 316,300<br><b>140,600</b>    | 7,900<br><b>10,710</b>       | 6,280<br><b>8,510</b>        |
| 2 3/8 AM PAC DSI+  | 2 7/8<br><b>73.0</b>  | 1 1/2<br><b>38.1</b>   | 185,000<br><b>82,200</b>     | 5,940<br><b>8,050</b>        | 2,970<br><b>4,020</b>        |
| 2 7/8 AM PAC DSI+  | 3 1/8<br><b>79.4</b>  | 1 1/2<br><b>38.1</b>   | 247,000<br><b>109,800</b>    | 6,680<br><b>9,050</b>        | 3,340<br><b>4,520</b>        |
| 2 7/8 AM O.H.      | 3 7/8<br><b>98.4</b>  | 2.151<br><b>54.6</b>   | 310,900<br><b>138,200</b>    | 8,000<br><b>10,840</b>       | 4,540<br><b>6,150</b>        |
| 2 7/8 AM O.H. LW   | 3 3/4<br><b>95.3</b>  | 2 7/16<br><b>61.9</b>  | 197,300<br><b>87,700</b>     | 5,030<br><b>6,810</b>        | 2,860<br><b>3,870</b>        |
| 2 3/8 FEDP         | 3 1/8<br><b>79.4</b>  | 1 1/4<br><b>31.8</b>   | 257,500<br><b>114,500</b>    | 5,350<br><b>7,250</b>        | 3,040<br><b>4,120</b>        |
| 2 7/8 HEF          | 3 1/8<br><b>79.4</b>  | 1 1/8<br><b>28.6</b>   | 301,600<br><b>134,100</b>    | 5,960<br><b>8,080</b>        | 3,390<br><b>4,590</b>        |
|                    | 3 1/8<br><b>79.4</b>  | 1 1/4<br><b>31.8</b>   | 276,000<br><b>122,700</b>    | 5,440<br><b>7,370</b>        | 3,090<br><b>4,180</b>        |
| 2 3/8 HT SL-H90    | 3 1/8<br><b>79.4</b>  | 1.976<br><b>50.2</b>   | 178,200<br><b>79,200</b>     | 6,410<br><b>8,690</b>        | 3,850<br><b>5,210</b>        |
| 2 3/8 SL-H90       | 3 1/8<br><b>79.4</b>  | 1 13/16<br><b>46.0</b> | 242,100<br><b>107,600</b>    | 5,200<br><b>7,050</b>        | 2,660<br><b>3,600</b>        |
|                    | 3 1/4<br><b>82.6</b>  | 2<br><b>50.8</b>       | 180,300<br><b>80,200</b>     | 4,650<br><b>6,300</b>        | 2,370<br><b>3,210</b>        |
| 2 7/8 SL-H90       | 4 1/4<br><b>108.0</b> | 1 3/4<br><b>44.5</b>   | 481,300<br><b>214,000</b>    | 14,550<br><b>19,720</b>      | 7,430<br><b>10,070</b>       |
|                    | 4 1/2<br><b>114.3</b> | 2<br><b>50.8</b>       | 400,300<br><b>178,000</b>    | 12,020<br><b>16,290</b>      | 6,140<br><b>8,320</b>        |
| 3 1/2 SL-H90       | 4 3/4<br><b>120.7</b> | 2<br><b>50.8</b>       | 760,000<br><b>338,000</b>    | 24,100<br><b>32,670</b>      | 12,310<br><b>16,690</b>      |
|                    | 4 3/4<br><b>120.7</b> | 2 3/4<br><b>69.9</b>   | 452,200<br><b>201,100</b>    | 15,860<br><b>21,500</b>      | 8,100<br><b>10,980</b>       |
| 2 3/8 API REG DSI+ | 3 1/8<br><b>79.4</b>  | 1<br><b>25.4</b>       | 344,200<br><b>153,100</b>    | 7,370<br><b>9,990</b>        | 3,680<br><b>4,980</b>        |
| 2 3/8 API Reg.     | 3 1/8<br><b>79.4</b>  | 1<br><b>25.4</b>       | 332,400<br><b>147,800</b>    | 5,320<br><b>7,210</b>        | 3,020<br><b>4,090</b>        |
| 2 7/8 API Reg.     | 3 3/4<br><b>95.3</b>  | 1 1/4<br><b>31.8</b>   | 438,600<br><b>195,000</b>    | 10,140<br><b>13,740</b>      | 5,760<br><b>7,800</b>        |
| 3 1/2 API Reg.     | 4 1/4<br><b>108.0</b> | 1 1/2<br><b>38.1</b>   | 623,200<br><b>277,200</b>    | 13,870<br><b>18,800</b>      | 7,880<br><b>10,680</b>       |
|                    | 4 5/8<br><b>117.5</b> | 2 3/16<br><b>55.6</b>  | 404,100<br><b>179,700</b>    | 10,650<br><b>14,430</b>      | 6,050<br><b>8,200</b>        |

**TOOL JOINT MECHANICAL PROPERTIES**

| Thread Type              | O.D.         | I.D.         | Tension<br>Yield<br>Strength | Torsion<br>Yield<br>Strength | Recomm.<br>Make-Up<br>Torque |
|--------------------------|--------------|--------------|------------------------------|------------------------------|------------------------------|
|                          | in<br>mm     | in<br>mm     | lbs<br>daN                   | ft.lbs<br>N.m                | ft.lbs<br>N.m                |
| 4 1/2 API Reg.           | 5 1/2        | 2 1/4        | 1,087,500                    | 27,410                       | 15,570                       |
|                          | <b>139.7</b> | <b>57.2</b>  | <b>483,700</b>               | <b>37,160</b>                | <b>21,110</b>                |
| 5 1/2 API Reg.           | 6 3/8        | 2 3/4        | 1,538,900                    | 37,770                       | 21,460                       |
|                          | <b>161.9</b> | <b>69.9</b>  | <b>684,500</b>               | <b>51,200</b>                | <b>29,090</b>                |
| 6 5/8 API Reg.           | 7 3/4        | 3 1/2        | 1,622,900                    | 75,490                       | 42,890                       |
|                          | <b>196.9</b> | <b>88.9</b>  | <b>721,900</b>               | <b>102,350</b>               | <b>58,150</b>                |
|                          | 7 3/4        | 2 13/16      | 1,997,800                    | 93,880                       | 53,340                       |
|                          | <b>196.9</b> | <b>71.4</b>  | <b>888,600</b>               | <b>127,280</b>               | <b>72,310</b>                |
| 7 5/8 API Reg.           | 7 3/4        | 3            | 1,903,700                    | 89,230                       | 50,700                       |
|                          | <b>196.9</b> | <b>76.2</b>  | <b>846,800</b>               | <b>120,970</b>               | <b>68,730</b>                |
| 7 5/8 API Reg.           | 9            | 3 3/4        | 2,455,300                    | 131,170                      | 74,520                       |
|                          | <b>228.6</b> | <b>95.3</b>  | <b>1,092,100</b>             | <b>177,840</b>               | <b>101,030</b>               |
| 8 5/8 API Reg.           | 10           | 3 3/4        | 3,605,800                    | 192,440                      | 109,340                      |
|                          | <b>254.0</b> | <b>95.3</b>  | <b>1,603,900</b>             | <b>260,910</b>               | <b>148,240</b>               |
| 2 3/8 API I.F.<br>(NC26) | 3 1/2        | 1 1/4        | 408,000                      | 8,100                        | 4,600                        |
|                          | <b>88.9</b>  | <b>31.8</b>  | <b>181,400</b>               | <b>10,980</b>                | <b>6,230</b>                 |
|                          | 3 3/8        | 1 3/4        | 278,400                      | 6,300                        | 3,580                        |
|                          | <b>85.7</b>  | <b>44.5</b>  | <b>123,800</b>               | <b>8,540</b>                 | <b>4,850</b>                 |
| 2 7/8 API I.F.<br>(NC31) | 4 1/8        | 2            | 443,400                      | 12,060                       | 6,850                        |
|                          | <b>104.8</b> | <b>50.8</b>  | <b>197,200</b>               | <b>16,350</b>                | <b>9,280</b>                 |
|                          | 4 1/8        | 2 1/8        | 398,900                      | 10,800                       | 6,140                        |
|                          | <b>104.8</b> | <b>54.0</b>  | <b>177,400</b>               | <b>14,640</b>                | <b>8,320</b>                 |
| 3 1/2 API I.F.<br>(NC38) | 4 3/4        | 2            | 803,600                      | 17,570                       | 9,980                        |
|                          | <b>120.7</b> | <b>50.8</b>  | <b>357,400</b>               | <b>23,820</b>                | <b>13,530</b>                |
|                          | 4 3/4        | 2 1/4        | 711,800                      | 17,570                       | 9,980                        |
|                          | <b>120.7</b> | <b>57.2</b>  | <b>316,600</b>               | <b>23,820</b>                | <b>13,530</b>                |
|                          | 4 3/4        | 2 11/16      | 525,100                      | 16,560                       | 9,410                        |
|                          | <b>120.7</b> | <b>68.3</b>  | <b>233,500</b>               | <b>22,450</b>                | <b>12,750</b>                |
| 4 API I.F.<br>(NC46)     | 6            | 3 1/4        | 809,900                      | 30,450                       | 17,300                       |
|                          | <b>152.4</b> | <b>82.6</b>  | <b>360,200</b>               | <b>41,280</b>                | <b>23,450</b>                |
| 4 1/2 API I.F.<br>(NC50) | 6 3/8        | 3 3/4        | 843,200                      | 34,160                       | 19,410                       |
|                          | <b>161.9</b> | <b>95.3</b>  | <b>375,000</b>               | <b>46,310</b>                | <b>26,310</b>                |
|                          | 6 5/8        | 3 3/4        | 843,200                      | 34,160                       | 19,410                       |
|                          | <b>168.3</b> | <b>95.3</b>  | <b>375,000</b>               | <b>46,310</b>                | <b>26,310</b>                |
| 5 1/2 API I.F.           | 7 3/8        | 4 13/16      | 1,138,500                    | 55,490                       | 31,520                       |
|                          | <b>187.3</b> | <b>122.2</b> | <b>506,400</b>               | <b>75,230</b>                | <b>42,730</b>                |
| 6 5/8 API I.F.           | 8 1/2        | 5 29/32      | 1,329,300                    | 74,950                       | 42,580                       |
|                          | <b>215.9</b> | <b>150.0</b> | <b>591,300</b>               | <b>101,610</b>               | <b>57,730</b>                |
| 2 7/8 SH                 | 3 3/8        | 1 3/4        | 278,400                      | 6,300                        | 3,580                        |
|                          | <b>85.7</b>  | <b>44.5</b>  | <b>123,800</b>               | <b>8,540</b>                 | <b>4,850</b>                 |
| 3 1/2 S.H.               | 4 1/8        | 2 1/8        | 398,900                      | 10,800                       | 6,140                        |
|                          | <b>104.8</b> | <b>54.0</b>  | <b>177,400</b>               | <b>14,640</b>                | <b>8,320</b>                 |
| 4 S.H.                   | 4 5/8        | 2 9/16       | 456,900                      | 13,770                       | 7,820                        |
|                          | <b>117.5</b> | <b>65.1</b>  | <b>203,200</b>               | <b>18,660</b>                | <b>10,600</b>                |



## TOOL JOINT MECHANICAL PROPERTIES

| Thread Type          | O.D.           | I.D.            | Tension<br>Yield<br>Strength | Torsion<br>Yield<br>Strength | Recomm.<br>Make-Up<br>Torque |
|----------------------|----------------|-----------------|------------------------------|------------------------------|------------------------------|
|                      | in<br>mm       | in<br>mm        | lbs<br>daN                   | ft.lbs<br>N.m                | ft.lbs<br>N.m                |
| 2 7/8 X-Hole         | 4 1/4<br>108.0 | 1 7/8<br>47.6   | 452,200<br>201,100           | 12,040<br>16,320             | 6,840<br>9,270               |
| 3 1/2 X-Hole         | 4 3/4<br>120.7 | 2 7/16<br>61.9  | 510,900<br>227,200           | 15,460<br>20,960             | 8,780<br>11,900              |
| 4 1/2 X-Hole         | 6 1/4<br>158.8 | 3 1/4<br>82.6   | 809,900<br>360,200           | 30,450<br>41,280             | 17,300<br>23,450             |
| 5 X-Hole             | 6 3/8<br>161.9 | 3 3/4<br>95.3   | 843,200<br>375,000           | 34,160<br>46,310             | 19,410<br>26,310             |
| 3 1/2 API F.H.       | 4 5/8<br>117.5 | 2 1/8<br>54.0   | 711,200<br>316,300           | 14,920<br>20,220             | 8,480<br>11,490              |
| 4 API F.H.<br>(NC40) | 5 3/4<br>146.1 | 2 13/16<br>71.4 | 638,100<br>283,800           | 21,340<br>28,930             | 12,120<br>16,430             |
| 4 1/2 API F.H.       | 5 3/4<br>146.1 | 3<br>76.2       | 871,100<br>387,400           | 31,500<br>42,700             | 17,900<br>24,260             |
|                      | 6 1/4<br>158.8 | 2 1/2<br>63.5   | 1,108,700<br>493,100         | 40,520<br>54,930             | 23,020<br>31,210             |
| 5 1/2 API F.H.       | 7<br>177.8     | 4<br>101.6      | 1,140,800<br>507,400         | 51,040<br>69,200             | 29,000<br>39,310             |
| 6 5/8 API F.H.       | 8<br>203.2     | 5<br>127.0      | 1,304,800<br>580,400         | 67,120<br>91,000             | 38,130<br>51,690             |
|                      | 8 1/4<br>209.6 | 4 3/4<br>120.7  | 1,515,400<br>674,000         | 78,340<br>106,210            | 44,510<br>60,340             |
| 3 1/2 D.S.L.         | 3 7/8<br>98.4  | 1 13/16<br>46.0 | 472,100<br>210,000           | 8,960<br>12,140              | 5,090<br>6,900               |
| 3 1/2 H-90           | 5<br>127.0     | 2 3/4<br>69.9   | 594,900<br>264,600           | 21,480<br>29,120             | 10,970<br>14,870             |
|                      | 5 1/4<br>133.4 | 2 3/4<br>69.9   | 594,900<br>264,600           | 21,480<br>29,120             | 10,970<br>14,870             |
| 4 H-90               | 5 1/2<br>139.7 | 2 13/16<br>71.4 | 822,400<br>365,800           | 32,360<br>43,870             | 16,530<br>22,410             |
| 4 1/2 H-90           | 6<br>152.4     | 3<br>76.2       | 978,900<br>435,400           | 41,200<br>55,850             | 21,050<br>28,530             |
|                      | 6<br>152.4     | 3 1/4<br>82.6   | 843,900<br>375,300           | 35,330<br>47,900             | 18,050<br>24,470             |
|                      | 6 1/2<br>165.1 | 2 13/16<br>71.4 | 1,073,000<br>477,200         | 45,330<br>61,450             | 23,150<br>31,380             |
| 5 H-90               | 6 1/2<br>165.1 | 2 13/16<br>71.4 | 1,290,100<br>573,800         | 57,540<br>78,010             | 29,400<br>39,860             |
| 5 1/2 H-90           | 7<br>177.8     | 3 1/4<br>82.6   | 1,290,700<br>574,100         | 60,240<br>81,670             | 30,780<br>41,730             |

**NOTE:**

Tensile / Torsion Values are based on 110,000 psi material yield strength.

Tensile Yield values are based on pin failure at zero torque.



## ROTARY SHOULDER CONNECTIONS INTERCHANGE LIST

| Common Name                                                            |       | Threads<br>per in. | Taper<br>in/ft | Same as or<br>interchanges with                                                          |
|------------------------------------------------------------------------|-------|--------------------|----------------|------------------------------------------------------------------------------------------|
| Style                                                                  | Size  |                    |                |                                                                                          |
| A.P.I. Internal Flush (I.F.)                                           | 2 3/8 | 4                  | 2              | 2 7/8 Slim Hole<br>N.C.26                                                                |
|                                                                        | 2 7/8 | 4                  | 2              | 3 1/2 Slim Hole<br>N.C. 31                                                               |
|                                                                        | 3 1/2 | 4                  | 2              | 4 1/2 Slim Hole<br>N.C. 38<br>3 1/2 Reed Wide Open (W.O.)                                |
|                                                                        | 4     | 4                  | 2              | 4 1/2 Extra Hole<br>N.C.46<br>4 Reed Wide Open (W.O.)                                    |
|                                                                        | 4 1/2 | 4                  | 2              | 5" Extra Hole<br>N.C. 50<br>5 1/2 Double Streamline<br>4 1/2 Reed Wide Open (W.O.)       |
| A.P.I. Full Hole (F.H.)                                                | 4     | 4                  | 2              | 4 1/2 Reed Double Streamline<br>N.C.40                                                   |
| A.P.I.Extra Hole (X.H.) (E.H.)<br>Hughes Extra Hole<br>Reed Extra Hole | 2 7/8 | 4                  | 2              | 3 1/2 Double Streamline                                                                  |
|                                                                        | 3 1/2 | 4                  | 2              | 4 Slim Hole<br>4 External Flush<br>4 1/2 F.H. Reed External Flush                        |
|                                                                        | 4 1/2 | 4                  | 2              | 4 Internal Flush<br>N.C.46<br>5 Double Streamline<br>4 Reed Wide Open (W.O.)             |
|                                                                        | 5     | 4                  | 2              | 4 1/2 Internal Flush<br>N.C.50<br>5 1/2 Double Streamline<br>4 1/2 Reed Wide Open (W.O.) |
| A.P.I Slim Hole (S.H.)<br>Hughe Slim Hole<br>Reed Slim Hole            | 2 7/8 | 4                  | 2              | 2 3/8 Internal Flush<br>N.C.26                                                           |
|                                                                        | 3 1/2 | 4                  | 2              | 2 7/8 Internal Flush<br>N.C.31                                                           |
|                                                                        | 4     | 4                  | 2              | 3 1/2 Extra Hole<br>4 1/2 External Flush                                                 |
|                                                                        | 4 1/2 | 4                  | 2              | 3 1/2 Internal Flush<br>N.C.38<br>3 1/2 Reed Wide Open (W.O.)                            |

**ROTARY SHOULDER CONNECTIONS INTERCHANGE LIST**

| Common Name                                                                |       | Threads<br>per in. | Taper<br>in/ft | Same as or<br>interchanges with                                   |
|----------------------------------------------------------------------------|-------|--------------------|----------------|-------------------------------------------------------------------|
| Style                                                                      | Size  |                    |                |                                                                   |
| Double Streamline (DSL)                                                    | 3 1/2 | 4                  | 2              | 2 7/8 Extra Hole<br>3 1/2 Double Streamline                       |
|                                                                            | 4 1/2 | 4                  | 2              | 4 Full Hole<br>N.C.40                                             |
|                                                                            | 5     | 4                  | 2              | 4 Internal Flush<br>4 Reed Wide Open (W.O.)<br>4 1/2 Xtra Hole    |
|                                                                            | 5 1/2 | 4                  | 2              | 4 1/2 Internal Flush<br>5 Extra Hole<br>N.C.50                    |
| Numbered Connection (N.C.)                                                 | 26    | 4                  | 2              | 2 3/8 Internal Flush<br>2 7/8 Slim Hole                           |
|                                                                            | 31    | 4                  | 2              | 2 7/8 Internal Flush<br>3 1/2 Slim Hole                           |
|                                                                            | 38    | 4                  | 2              | 3 1/2 Internal Flush<br>4 1/2 Slim Hole                           |
|                                                                            | 40    | 4                  | 2              | 4 Full Hole<br>4 1/2 Double Streamline                            |
|                                                                            | 46    | 4                  | 2              | 4 Internal Flush<br>4 1/2 Extra Hole                              |
|                                                                            | 50    | 4                  | 2              | 4 1/2 Internal Flush<br>5 Extra Hole<br>5 1/2 Double Streamline   |
| A.P.I External Flush (E.F)<br>Hughes External Flush<br>Reed External Flush | 2 3/8 | 4                  | 2              | 2 3/8 Homco External Flush                                        |
|                                                                            | 3 1/2 | 4                  | 2              | 3 1/2 F.H. Reed External Flush                                    |
|                                                                            | 4 1/2 | 4                  | 2              | 4 Slim Hole<br>3 1/2 Extra Hole<br>4 1/2 F.H. Reed External Flush |
| API Regular                                                                | 5 1/2 | 4                  | 3              | 5 Union Regular                                                   |
|                                                                            | 6 5/8 | 4                  | 2              | 5 Union Tool F.H.<br>6 Union Tool Regular                         |
| Reed Open Hole,<br>Reed Full Opening                                       | 2 3/8 | 4                  | 1 1/2          | 2 3/8 American Open Hole                                          |
|                                                                            | 2 7/8 | 4                  | 1 1/2          | 2 7/8 American Open Hole                                          |
|                                                                            | 3 1/2 | 4                  | 1 1/2          | 3 1/2 American Open Hole                                          |
|                                                                            | 4     | 4                  | 1 1/2          | 4 American Open Hole                                              |



**BLANK**